SPECIAL COLOR ISSUE

POPULAR PHOTOGRAPHY

WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

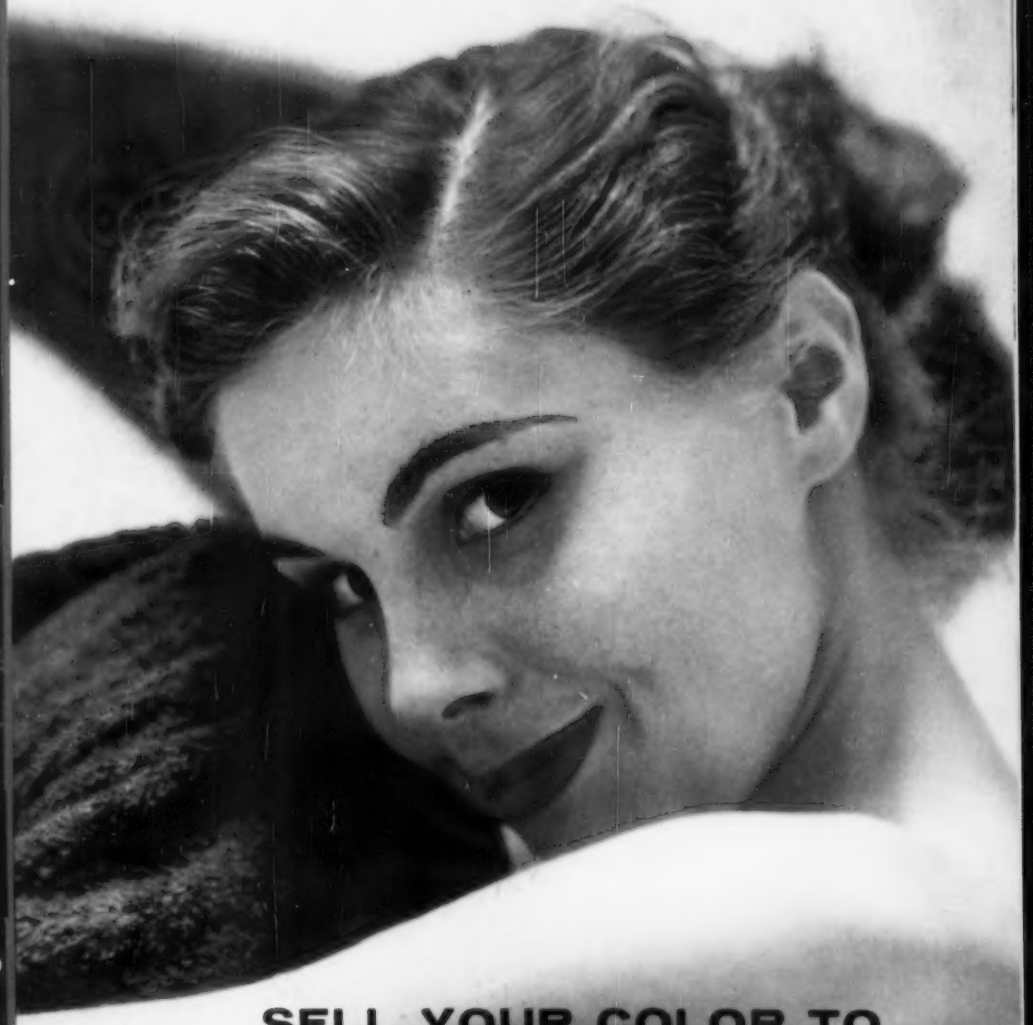
SEPTEMBER, 1956 ★ 35 CENTS

EXCLUSIVE FIRST:
PROFESSIONAL SECRETS
OF COLOR RETOUCHING
REVEALED

VEEGEE'S CARICATURES

COLOR PROCESSING
WITHOUT A DARKROOM

16 PAGES IN FULL COLOR!



SELL YOUR COLOR TO
THE CALE

2 NEW ANSCO FILMS

P-55-33619-28
UNIVERSITY OF MICROFILMS
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O. C. "Ozzie" Sweet sheds new light on high-speed Anscochrome

"For splendid overall color rendition, I rate this shot highly. Reds, blues, whites and yellows all have a natural 'live' look. Notice, too, the fine skin tones . . . and the texture of the water-soaked wharf. Taken at 1/100 second at f11."

To get the real "lowdown" on new, high-speed Anscochrome, Ozzie Sweet made it a point to keep all his special equipment under lock and key. He used no professional "tricks". No filters. And the camera he took along was probably no faster than the one you're now using. But he *did* take one wise precaution: He loaded his camera with our versatile new Anscochrome film.

Rated at Exposure Index 32, Anscochrome is actually *3 times faster* than traditional color films. It's *so* fast, it actually makes an f3.5 lens just as good for color as a super-speed f2.0. And that holds true, *even* in unfavorable dim light.

You can shoot new Anscochrome at high speeds, and literally "freeze" fast action in its tracks . . . with no loss of color or detail. You can shoot it "stopped down" for crisper backgrounds, and retain every bit of soft, natural color. Shoot it *any*time . . . on grey days . . . in shadow . . . at dawn or dusk . . . at night with flash . . . and count on getting colors just as true as life itself.

Now, take a careful look at Ozzie Sweet's pictures. Aren't the color results everything you'd like *yours* to be? Don't they make *you* want to try new Anscochrome . . . first chance you get?

ANSCO, Binghamton, N. Y. A Division of General Aniline & Film Corporation.

It's a great year 3 times faster

Just how well does new Anscochrome stand up under all lighting conditions? To find the answer, ace magazine photographer Ozzie Sweet put our versatile new film through its paces. Here are some of his favorite shots, and, directly underneath, his "unretouched" comments.

"Often, a semi-backlit shot like this means excessive contrast and marked color distortion. But here, from edge to edge, the colors are soft and completely natural. Taken at 1/50 second at f11."

"Here's proof you can 'freeze' action with no loss of color detail. Even delicate flesh tones come up beautifully . . . and just *look* at those breakers! Shot at 1/200 second at f8."

"Her face is entirely in shadow, yet Anscochrome produced no color distortion. Here's where good latitude and true-color reproduction pay off. Pleasing, too, are the superb *textures*. I took this at f8 at 1/25 second."

Good reasons all for loading your camera with new Anscochrome

- **High Speed** . . . rated at Exposure Index 32, *three times faster* than traditional films
- **Finer Color** . . . in sun or shadows, colors stay true, natural "alive" . . . no wash-out, no "heavying up," no "far-off" tones
- **Wide Latitude** . . . gives more natural, balanced color, even in deep shadows, over a wider range of exposures
- **Uniform Gradation** . . . new softer scale assures more stable, uniform gradation in all lighting situations
- **In Dim Light** . . . transparencies are fully-exposed, with no blacked-out areas . . . no *need* for a super-speed lens
- **Indoors** . . . extra speed and latitude give flashbulbs far more coverage . . . use *blue* bulbs with daylight-type . . . *clear* bulbs with tungsten-type.

Buy Anscochrome in rolls, sheets, 35mm magazines and for 16mm movie cameras

for color with new Anscochrome!

(*Exposure Index* 32) *than traditional films!*

Photo taken at f/22, 1/60 second on Ektachrome with No. 5 flash lamp, using the Graphic 35 and Universal Spectramatic flash settings.

Use a Graphic 35 for Color!

THE ONLY CAMERA IN THE WORLD WITH PUSH-BUTTON FOCUSING AND NEW UNIVERSAL SPECTRAMATIC FLASH SETTINGS

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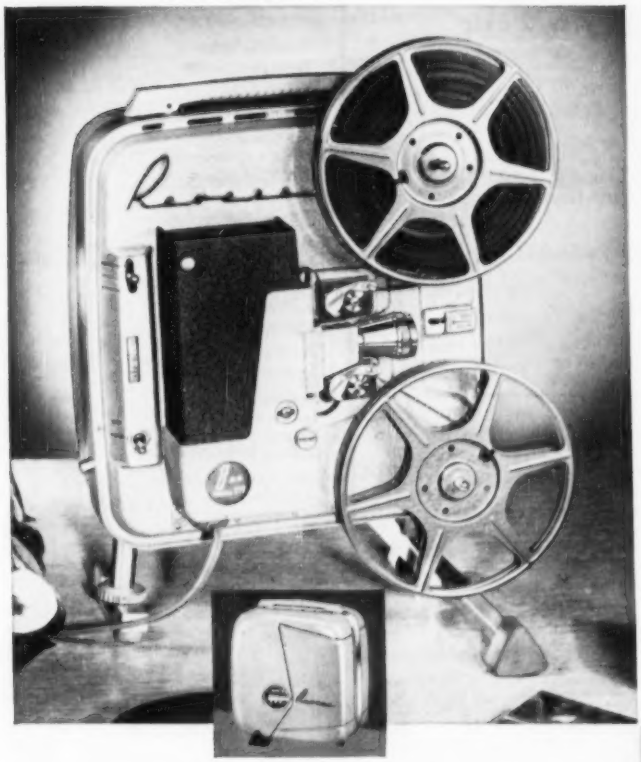

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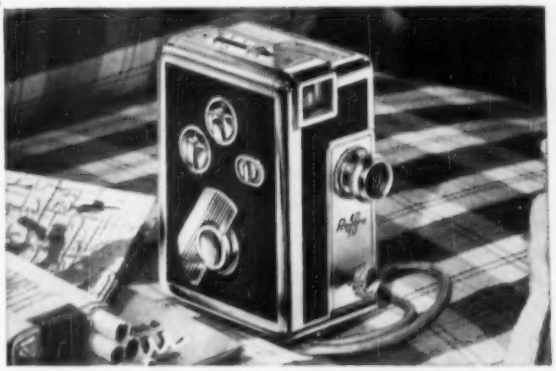

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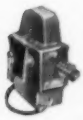

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POPULAR PHOTOGRAPHY

including CAMERA and AMERICAN PHOTOGRAPHY

WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

Phyllis Walker was photographed by Howell Conant as part of a series practicing the use of a hand-held camera in the studio. The camera was a 4x5 Series D Graflex with a 7½-in. Kodak Ektar f/4.5 lens. A 64,000-watt-second Ascor flash unit furnished bounce illumination and the exposure was 1/5 sec. at f/4.5.

Other photos: (top) Weegee; (center) T. F. Bastet; (bottom) Shelley Grossman.

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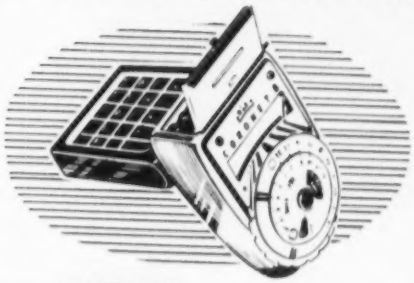

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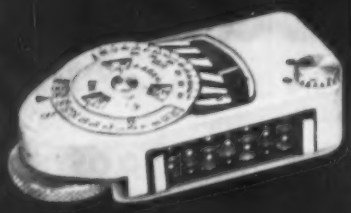

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TOOLS AND TECHNIQUES

by Norman C. Lipton

A round-up of recent developments and significant trends

Projection Lamps. The replacement of slide and motion-picture projection lamps will be greatly simplified for the consumer in the near future by the recent adoption of a new American Standard lamp-identification system by the four lamp manufacturers in the field. Identification will be accomplished by the use of a three-letter code which utilizes all the letters in the alphabet except I, O, Q, and U and thereby makes possible 10,658 combinations. Any and all lamps which are physically suitable for use in a given projector by virtue of dimensions, lamp-base type, and other characteristics needed to insure *interchangeability* will have the same three-letter code designation. (The specific letters in the code and their order are completely meaningless.) Wattage, voltage, and the burning position of the lamp may be indicated on the bulb and carton label along with the code letters—at the discretion of the particular manufacturer. This system will minimize the frustration of projector owners who are frequently confronted with a choice of many lamps of the desired wattage and voltage, of which only one or two can physically fit their particular equipment. Assignment of codes and administration of the lamp-coding system will be handled by the American Standards Association. By way of cooperation, projector manufacturers are planning soon to place on the name plate of their equipment the codes for the proper lamps that can be used with that particular equipment. Users need only refer to the code in ordering lamps.

Two Technical Conferences. During the past year, a number of important steps have been taken to establish a new society of photographic scientists, engineers, and technologists. The main idea has been to eliminate the duplication of effort in the publication, convention, and membership-recruiting activities of the Society of Photographic Engineers and the Technical Division of the Photographic Society of America. While individuals from both groups have been laying the groundwork for an efficient unified organization, the two organizations held separate conferences this past May which were a tribute to the vigor and resources that each is capable of contributing to their future enterprise, if and when it materializes.

The first of the two meetings was the Sixth Annual Conference of the SPE held at the U. S. Hotel Thayer, West Point, N. Y., from May 7 through 11, with the cooperation of the U. S. Air Force. A total registration of 450 members and guests was recorded throughout the five-day event, which covered the entire field of photographic science and engineering on a broad front. The PSA Technical Division meeting was a Color Processing Conference conducted at the Hotel Seneca in Rochester, N. Y., on May 25 and 26. The timely subject attracted some 700 registrants, more than half of the number coming from outside of the Rochester-Binghamton area. This meeting took the place of the technical-papers sessions usually conducted at the annual conventions of the entire Photographic Society of America (the 1956 event is scheduled for Denver from September 25 to 29). Incidentally, both conferences were accompanied by equipment exhibits attended by technical representatives of the participating exhibitors.

1956 SPE Conference. This year's meeting was broadly divided into sessions dealing with The Photographic Process, Photographic Apparatus, Aerial Reconnaissance and Evaluation of the Photographic Process, with the opening half day devoted to a history of photographic engineering in America and a miscellany of related subjects. From the standpoint of significant trends, we found two papers to be of particular importance—both representing progress in the application of electrostatic photography. The first of these *Development of the RCA Electrofax Microfilm Enlarger*, was presented by H. G. Reuter, Jr., of RCA's Commercial Electronic Products Department at Camden, N. J. It described a high-speed continuous-reproduction apparatus designed for the U. S. Navy's Bureau of Aeronautics Filmsort system. The machine, which was first shown to the military last February, is 10 feet long, four feet wide, and four feet high. It reproduces engineering prints directly from card-mounted or roll-type microfilm originals by means of the RCA Electrofax process, with the receiving paper web moving at a rate of 22 feet per minute (handling 15 "C-size" prints per minute). The second paper, *Xerography and the IBM Electrostatic Printers*, by W. D. Bolton and W. E. Goetz the IBM Engineering Laboratory, Endicott, N. Y., disclosed the construction details of IBM's new Model 938 Electrostatic Card Printer and Model 939 Electrostatic Address Label Printer in which such new xerographic techniques as fur-brush development, selective infrared fixing, pressure fixing, and roll transfer are employed. Both papers will be published in a forthcoming issue of the Society's journal, *Photographic Engineering*.

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1. *Combined viewfinder-rangefinder* of life-size image offers the benefits of both split-image and coincident-image focusing.

2. *Bright-line frames* in viewfinder are automatically brought into position by the interchangeable 50mm, 90mm, 135mm lenses; frame selector offers preview of fields of view.

3. *Automatic parallax compensation* is continuous for all lenses, from infinity to closest distances.

4. *Two-stroke film advance* fastest rapid-lever method, permits continuous picture-taking without moving camera from the shooting position.

5. *Viewfinder accuracy* is unaffected when viewing at oblique angles; extra-large eyepiece guarantees perfect sighting even when wearing glasses.

6. *Automatic film counter* resets itself for next roll of film when take-up spool is removed from camera.

7. *Shutter speeds on one dial* (click-stops: 1 to 1/1000 second, and B for time exposure).

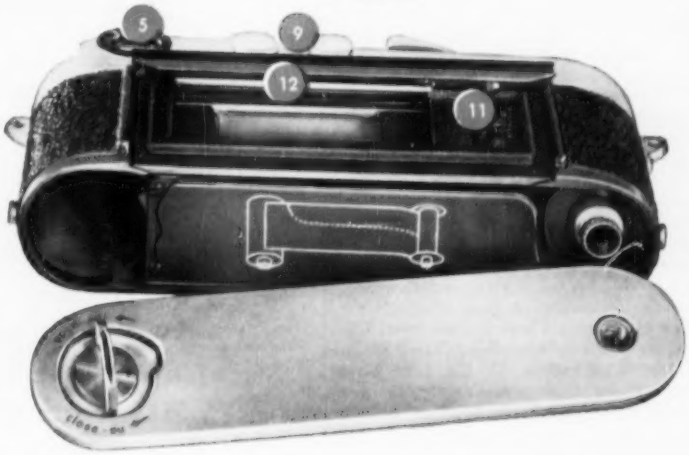
8. *Removable exposure meter* couples with entire range of shutter speeds, has extremely wide range of light sensitivity.

9. *Internal contact adjustment* assures full flash synchronization for many types of flashbulbs, and electronic flash at 1/25 and 1/50.

10. *Bayonet lens mount* combines quick-change convenience with the precision formerly associated only with the screw-thread types.

11. *Hinged back plate* for easy loading and inspection; constructed so that the rigidity of the classic LEICA housing is maintained.

12. *Extra-large glass pressure plate* and long, precision-ground film tracks guarantee a truly flat film plane.



In addition to its exclusive innovations, the LEICA M-3 retains all of the sound and time-tested principles that long have been identified with LEICA camera design.

- rugged camera housing, functional design
- each lens precision-matched to its focusing mount
- quiet, smooth-running focal-plane shutter
- interlocking shutter release prevents double exposures
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- widest range of accessories in the 35mm field
- twelve superb lenses (from 28mm to 400mm) available

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erated by electrolysis was brought up to date with a paper by G. M. Haist, J. R. King, A. A. Rasch, and J. I. Crabtree entitled *Development in Metal Ion-Chelate Systems.* In contrast to the first paper on the subject (reported in *T&T*, February 1954) which dealt with vanadium in hydrobromic acid solution which changed color when the vanadous ion was oxidized to the vanadic form in the course of development, this later report has to do with such metal ions as titanium and iron with a chelating (or sequestering agent) such as ethylene diamine tetracetic acid (EDTA). It was shown that titanium developers gave excellent photographic results and that the colorless oxidation products permitted their use in one-step (developing and fixing) monobaths. Yet they have a serious drawback in that they give their best performances at extremely low pH —the highly acidic solution being very difficult to handle as far as containers, piping, and skin contact are concerned. . . . Further progress with monobath systems for film processing was reported in a paper by H. S. Keelan of the Boston University Physical Research Laboratories—*Photographic Monobaths for Rapid Processing II.* It was disclosed that the inherent loss of effective emulsion speed could be overcome by the addition of triaminophenol trihydrochloride to the previously published Boston University Monobath #315. However, a problem of instability still remains to be solved with the improved formula. . . . Still another paper, *The Effect of Salt Baths on Hypo and Silver Estimation,* by the Kodak Research Laboratory team of R. W. Henn, Nancy King, and J. I. Crabtree, described the relative effectiveness of sodium sulfite with a sequestering agent in a neutral solution as a hypo eliminator and gave us an insight into the mechanics of the recently introduced Kodak Hypo Clearing Agent which gives optimum film permanence with minimal washing times. (Archival quality is produced by a 10-minute immersion in the clearing agent and a 40-minute water wash.)

Among the equipment and applications papers at the conference which contribute to the broadening of photography's role as an instrumentation tool were the following: *A New Photo Method for Measuring Three Dimensional Objects,* by Mylon Merriam, Army Map Service, Washington, D. C.; *Low Cost 16-mm Pulse Operated Camera for Instrumentation,* by A. C. Mueller, Bell & Howell Co., Chicago (a description of the B&H 200-P magazine camera which replaces the conventional spring motor with a pulse-operated solenoid so as to produce a maximum of 8 pictures per second at exposures ranging from ½ to 1/100 second, by changing the length of the electrical pulse to the solenoid); *Problems in the Design of High Speed Rotating Prism Cameras* by John H. Waddell, Fairchild Camera and Instrument Co., Syosset, N. Y. (a discussion of the design of two new high-speed Fairchild motion-picture cameras introduced at the SMPTE Convention in New York during the preceding week).

(*Continued on page* 12)

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as it did for my wife and I, says Larry S. Brown businessman, Mayor of Greenville, Michigan

For 26 years, Mr. Brown was so prominent in another career field that through respect justly earned, he was even elected Mayor of his town. Yet when maturing years made a less strenuous occupation advisable, he picked NYI for the training that would turn his favorite hobby into a profitable, exciting new career!

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"The National Geographic Magazine has already accepted six of my pictures for future publication — quite a nice feather in the cap of a pictorial photographer!"

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at the **AMATEUR** *price*

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PSA-TD Color Conference. Almost a score of papers, supplemented by a round-table clinic and a choice of field trips to Kodak color-laboratory installations, comprised the Rochester Color Conference. Executives and key personnel of prospective and existing color-processing laboratories throughout the country attended the event along with a large group representing manufacturers of color materials and processing equipment. In sponsoring and arranging the program, the Technical Division of the Photographic Society of America rendered a service of incalculable value to the photographic public at large. For the color-processing organizations whose people attended the conference were given an intensive course in the characteristics of the color materials they will be handling in the months to come as well as in processing equipment and procedures that will enable them to produce optimum results with greatest possible economy. In addition to color materials, color equipment, and processing techniques, the papers covered the subjects of quality control, safety, standardization, chemical packaging, and finance. Aspects and details which were not covered in the formal program were aired in informal lobby discussions and at the booths of exhibiting organizations. Three of the papers presented at the conference had been preprinted in the May 1956 issue of *Photographic Science and Technique*, official technical quarterly of the PSA, which was distributed to registrants at the conference. Most of the balance will be published in succeeding issues.

From a news standpoint, the single major disclosure was a presentation by Ansco technologists of the characteristics and processing procedures for their new Anscochrome Printon Film (for direct print making from color transparencies). The new color-print material is expected to be generally available to processing laboratories through the country and to individual darkroom workers late this summer or in the early fall. John R. Kane's paper, *Characteristics of the New Anscochrome Type Printon Film* (prepublished in the May issue of *PS&T*), included illustrations and charts depicting the improvements over the older type Printon in the way of higher maximum densities, longer exposure scale, cleaner whites, improved latent image stability and (time-intensity) reciprocity characteristics. Carl E. Johnson covered *Processing Procedures for the New Anscochrome Type Printon Film* in which the quality advantages and economies of solution replenishment were stressed. For example, with a replenishment system over a 3-week period, a given volume of solution was said to provide 6 times more processing capacity than an exhaustion-and-discard system. Interchangeability with processing solutions for the older-type material was also covered.

An extremely valuable contribution to the conference for individuals pondering the economics of Ektachrome film processing and Kodak Type R color-print making was made by Donald M. Klad-

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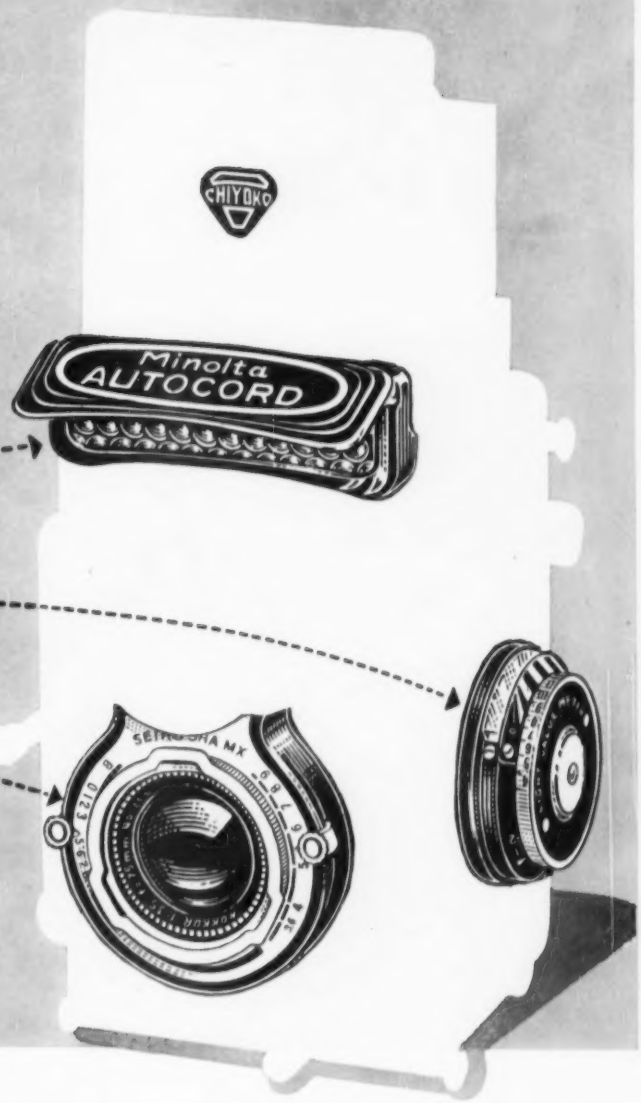

NEW built-in exposure meter

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NEW super-simple diaphragm and shutter calibration in terms of light values

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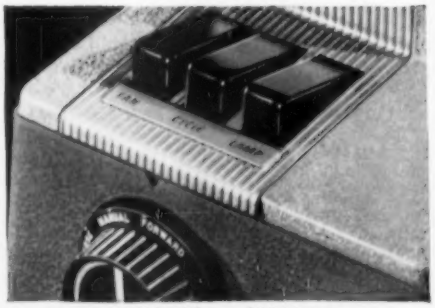
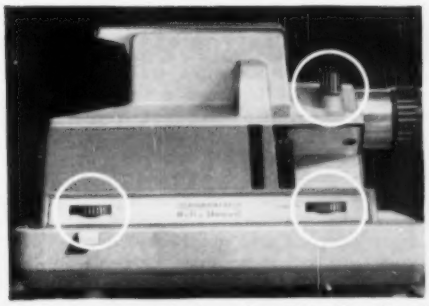
It's front row center for you! The exciting new Robomatic runs itself while you take any seat in the house. It's the most advanced automatic projector on the market today.

"Take-your-choice" time cycle control! Calibrated dial times slides automatically . . . from moments to minutes. Handy push-button lets you change or hold slides at will.

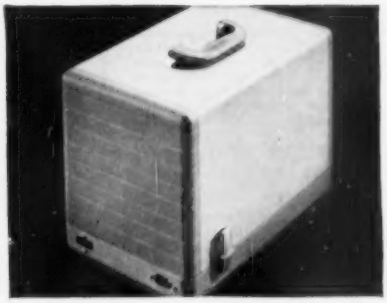


Streamlined "dashboard"! Note convenient control grouping of the fan, lamp and cycle switches. Has control dial for automatic forward, reverse or manual.

Bell & Howell's New ROBOMATIC Slide Projector



Easy positioning, focusing, leveling! Fluted focusing knob gives hairline adjustment. Other controls on same side provide natural "right hand" operation.



Functional beauty, built to last! All-metal, scuff-proof projector fits compactly (with all controls) into matching case. Lightweight, looks good, goes anywhere.

Just set it and relax. Your color slides *show themselves!* You can show up to 45 minutes of slides and never touch the projector. See the all-new TDC Robomatic in automatic action at your Bell & Howell dealer's or write for free folder. Bell & Howell, 7106 McCormick Road, Chicago 45, Illinois. Yours complete, with matching case, only $149.50.

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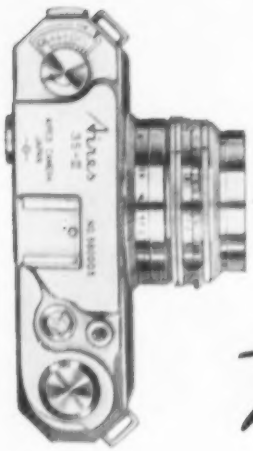

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- f 1.9 amber-coated coral 4.5cm 6-element lens.
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TRIMMING-TYPE range viewfinder. Permits more exact selection of scene. Adjusts perfectly for parallax. Ideal for focusing on fast moving objects. Assures clear image even in dim light.

Focus points permit photographers with spectacles to see the image accurately.

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strup of the Eastman Kodak Company's Credit Department—*Financial Aspects of Color Finishing.* In this paper, hypothetical estimates (not based on Kodak experience) was projected as follows: For an Ektachrome film processing operation involving 50,000 35-mm rolls (an average of 200 rolls daily), the cost of equipment was estimated to be $12,500. With necessary working capital estimated at $8,250, a total investment of $20,750 would be required. Assuming the use of rented quarters, all work except management, office work, maintenance, and delivery performed by four employees, and with operating costs covering labor, chemicals, readymounts, packing supplies, and depreciation of equipment, rent, utilities and delivery expenses, the total estimated operating cost comes to $32,870 or 65.7 cents per roll. For a Type R color-print operation involving 100,000 prints per year (an average of 520 daily), equipment cost (covering a Type 1R Kodak printer with Kodak Processing Reels and other accessories) was estimated at $6,000. Adding $5,200 for working capital, the total investment would come to $11,200. A 35-percent waste factor was used to cover make-overs and short paper lengths with half the volume 3½ x 5½-inch prints and the remaining half 2½ x 3½-inch wallet-size prints. Assuming rented space and 2 operating employees, operating costs are estimated at $20,700. . . . The importance of making separate estimates for each individual plant was emphasized, in order that varying local conditions may be properly considered. The need for waste control was also pointed out, since make-overs will increase the cost of paper, chemicals, and labor.

Two papers at the conference were intended to give the audience a perspective of established processing operations. *Volume Color Film Processing in Practice* by John O. Bostrup, Armed Forces Institute of Pathology (prepublished in the May *PS&T*) described quality processing of large volumes of color film with emphasis on trouble-shooting procedures. *Ten Years Experience in Color Finishing* by Leo S. Pavelle and Lloyd E. Varden described some of the problems that were solved by the Pavelle Color Incorporated color-print finishing and film processing operation from the time when this pioneer independent organization first set up shop.

Argus Cintagon Lens. During a visit to the Argus Camera Company's plant at Ann Arbor, Mich., last April, we had a chance to observe first-hand the manufacture of Argus 50-mm camera lenses on a rigidly controlled mass-production basis. The focal length of each lens produced is held to close tolerances to fit the fixed dimensions of the lens mount. Lens elements that don't meet specifications are scrapped and remelted. It was also interesting to note that the availability of the MIDAC (Michigan Digital Automatic Computer) "magic brain" at the nearby University of Michigan premises was being used by the company's engineers to improve existing lens de-

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A new panchromatic film has been perfected for the remarkable 60-second Polaroid Land Camera. Now, when you pull a picture out of the Polaroid Land Camera, you're going to look three times. Is this really a Polaroid Land picture? Details come out magnificently sharp. Skin tones are softer, more flattering. Lipstick never goes black. And pictures taken with the new films *don't fade;* they last just like any other pictures. (Copies and enlargements are better than ever, too.) You'll take pictures you never dreamed would be possible. New Polaroid PolaPan Land Film is so sensitive you can shoot in one-fourth the light you used to need. You can take many pictures indoors without flash . . . you can shoot excellent pictures outside on gray, rainy days.

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One look at Heiland's new charcoal gray Foto-Mite and you'll instantly see why it makes all other BC units obsolete.
The Foto-Mite is so compact it slips into your pocket without a bulge. It has a big exposure dial that takes all the guesswork out of correct camera settings. Its specially designed, genuine metal reflector is revolutionary—for it allows just the right amount of light to "spill" over the edge, giving you flattering pictures with softer shadows than ever before possible with flash.
And you get a distinct and different choice of light from all bayonet-base bulbs, including M-2 types. There's a test light to indicate when both battery and lamp are in operating condition, an extension outlet for multiple flash work, locking universal shoe and universal shutter cord with both ASA and European connector.
If your flash unit doesn't have *all* these features—then see the Foto-Mite now at your photo dealers!

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signs rather than to devise new formulas. The first product of their efforts, the 50-mm Cintagon f/2.8 lens now being furnished as the normal lens on the new Argus C-44 camera, is said to be one of the first commercial lenses completely designed with the aid of high-speed automatic-computing equipment. (Meridional and skew rays can be traced through an entire lens system in less than 2 seconds, thereby permitting all the calculation required for the analysis of a system to be completed in a little more than 2 minutes.)

The main design objective in the development of the 50-mm Cintagon lens was to produce a high degree of image contrast coupled with a resolution limit that was in keeping with the graininess and resolution characteristics of present day amateur films—in other words, the best practical compromise that would produce optimum image definition. Other requirements were maximum light transmission, minimum vignetting, and simplicity of construction. The end product was a modification of the four-element Tessar formula, utilizing a high-refractive-index rare-earth crown element. Uniformity of illumination across the field and the ability of the lens to stop down to the small apertures demanded by flash illumination were achieved by mounting the center element and the cemented rear doublet on ground, stepped shoulders. The entire lens is assembled into a differential double helical-focusing mount which is coupled to the camera's superimposed-image rangefinder to provide accurate automatic focusing.

Odds & Ends. The first "baseless" flashbulb to be distributed in the United States will appear here by early fall—the Amplex PF-1 My-T-Myte. This type of flashbulb construction, discussed in *T&T* for June 1955, affords very low cost as well as compactness. A re-usable single-contact bayonet base made of metal holds each lamp in place by its tapered glass stem. A lever on the base is used to eject each bulb after it has been fired. Prices were not announced at press time for this issue.

. . . A recent advisory from Technicolor Inc. announces a new graphic-arts division which will specialize in a new economical three-color lithography system suitable for runs ranging from a few hundred to thousands of printed copies.

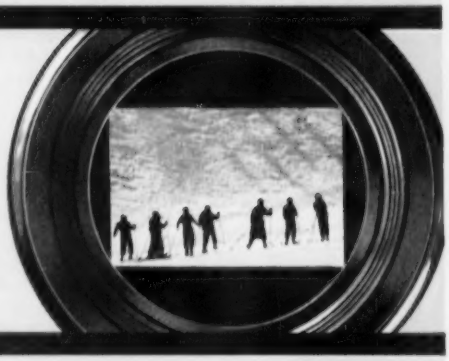
. . . Franke & Heidecke, manufacturers of Rollei cameras, began operations in 1920 and expect to turn out their millionth camera during the current calendar year, according to Horst Franke, president of the concern. At a press conference last spring, Mr. Franke also observed that demand for the 2.8D Rolleiflex was running ahead of his company's estimates by a considerable margin. . . . Rollei prices will be maintained at their present level despite a 10 percent wage increase instituted at the F&H factory in Brunswick, German Federal Republic—unless the company's lens and shutter suppliers are obliged to raise their prices.—

Only Canon's Exclusive 3 Position BUILT-IN VIEWFINDER Gives You The 3 Views That Count!

There is only one camera . . . Canon V, that offers you today's three most-needed viewfinder settings: 50mm and 35mm (both without resorting to an auxiliary viewfinder) and "RF" for critical rangefinder focusing!

At the popular 50mm focal length, see the large, bright, full-viewfinder size image, sharply defined and true! And note that Canon offers you a choice of four lenses in this focal length: 50mm f:1.2, f:1.5, f:1.8 and f:2.8.

A flick of the finger switches Canon's viewfinder to the 35mm image—full size and brilliant, like the 50mm position. This lens type has become increasingly popular as a "normal" focal length, for its greater depth of field—so necessary in this age of "available light" wide aperture photography. Canon's 35mm lenses boast apertures as wide as f:1.8. Combine the speedy focusing made possible by this increased depth of field, with Canon's rapid single-stroke advance mechanism, and you have faster consecutive exposures than ever before possible!



With focal lengths longer than 50mm, the depth of field becomes increasingly more shallow. This necessitates super-critical focusing. Only Canon offers a separate *"RF"* view, generously magnified for instant, "on-the-button" focusing.

Actually, the Canon viewfinder incorporates three distinct optical systems for its three settings. It doesn't merely outline a decreased field of view, as focal length increases. You always see the image—big, bright, full-size!

See the new Canon V at your franchised dealer . . . its many unique features will show you why it has been rated "the most advanced 35mm camera of its day!"

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Canon V

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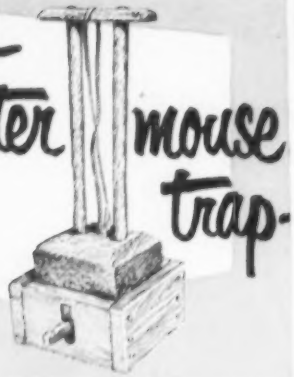
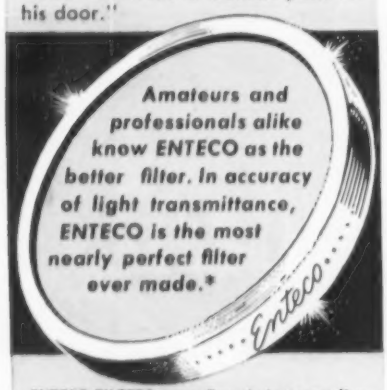
a better mouse trap-



When a mouse took the cheese in this ancient dead-fall trap, a wooden block fell, knocking the little fellow out. This early stratagem in man's eternal struggle with mice recalls Emerson's famous words: "If a man write a better book, preach a better sermon, or make a better mouse-trap than his neighbour, tho' he build his house in the woods, the world will make a beaten path to his door."



ENTECO FILTERS mean fine shots **more often** for you . . . and true color balance for your color work. Perfected in Enteco's own optical plant, tested six times in process, they are by far the best filters you can buy. Protected by a handy case, with full directions, all types are available in sizes 21.5 mm, Ser. 4 to Ser. 9. Priced from $1.70 to $10.50.

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*Electrical Testing Laboratories, Inc., found ENTECO'S transmittance curve on Type A (85) filters within .3 of 1% of the established standard. Two other popular filter brands were off by 9.5% and 27.5% respectively.

Enteco.....

. . . Filters and Lens Attachments make Better Pictures ALWAYS

ENTECO INDUSTRIES, INC.
610 KOSCIUSKO ST., BROOKLYN 21, N. Y.

LETTERS TO THE EDITOR

About Filters

This letter refers to the articles in the June issue of POPULAR PHOTOGRAPHY, *How Filters Fit Your Camera* by Arthur Barney.

The part of this article covering "The Construction of Glass Filters" has glaring omissions of information which tend to mislead the reader into believing that filter construction exists only within the scope covered by Mr. Barney's article.

Mr. Barney limits his story on laminated filters to the type using gelatin as the laminate. He mentions Kodak frequently, and presents the story as though there is no laminate other than gelatin. This is most unfortunate because it is our understanding from frequent market surveys, that most of the laminated filters on the market today, do not use gelatin as the laminate. But what is most important, he does not reveal that the laminated-type filter was developed only because of the limitations in solid glass!

Enteco is a prime producer of solid glass filters. However, solid glass cannot be used for color film filters because there is no solid glass on the market today that contains the color to give correct results when used with color films. The reason for this lies in the fact that certain transmittance curves cannot be duplicated in solid glass. And that is why Enteco developed a laminated type of filter (that does not use gelatin as a laminate). It has been found that should the filter be off in transmittance by as little as 5%, the difference would show up in the picture as unbalanced color. You see, the color can be controlled by dyeing the laminate.

Enteco's laminate, which is one sixth the thickness of gelatin, has characteristics that make it greatly superior to gelatin. It withstands extremes of temperature (—92 degrees to plus 165 degrees Fahrenheit) which gelatin cannot. It is entirely moisture and fungus proof. As Mr. Barney points out, gelatin, when used as a laminate, will "cause fading and discoloration." It can be added that the swelling of gelatin, because of moisture, will deteriorate the filter. On the other hand, this is not the case with Enteco's filters, which are actually stored *under water* during processing to prevent the surfaces from getting hurt by abrasive particles that may be in the air and settle on the glass surfaces.

The portion of his article "Filter checkpoints" (paragraph #3) is incorrect in that no deviation from parallelism can occur should an Enteco filter be dropped! Frankly, it is questioned that this could be the case with Kodak's also. Rotating a filter and perceiving movement is no deterrent from quality. It is known as "deviation of arc." Very evident deviation simply shifts the image. This image shift is not significant at all.

You can easily see how unfair this article is to us.

WILLIAM TIGER
Enteco Industries, Inc.
Brooklyn, New York

Australian Olympics Again

Re: Bob Forman's letter (January, 1956) that the prohibition of amateur photography at the Australian Olympic Games, "is so typical of British officialdom, it's priceless!" Who told him that! We are Britishers, as Australia is part of the British Commonwealth, but we have our own flag. So please, don't say "British officialdom" but Australian officialdom, for you insult the English as well as us. Otherwise you and I will have to shoot it out with Speed Graphics. Incidentally, the Australian secretary of the Olympic games preparations published a statement that the ban on cameras was to prevent people from standing for a "better angle," obstructing the view of the person behind. It was also stated there would be no policing of the rule, depending on each one's honesty instead.

V. L. W. BOLAND
Brisbane, Queensland, Australia

Color Controversy

I resent the Department of Justice's decree which forced Eastman Kodak to cease processing color film. I resent being forced to take film to a dealer for processing, making another trip to pick it up, eliminating the convenient mailing procedure. Neither time nor money is saved. And there is an even more alarming aspect to this decree. Eastman Kodak is denied exclusive rights to color-film developing although it pioneered in this field. As manager of a small business, I am aware of the competitive effects of giant corporations on small businesses; nevertheless, I feel strongly that the rights of invention belong to the owner. POPULAR PHOTOGRAPHY, as the most widely read photographic publication in the United States, should take a firm editorial stand on this issue, so that right can be done.

E. OLSHANSKY
Chicago, Illinois

• *See editorial on page 37—Ed.*

Ad Adds

I found the article, *Your Camera's Parts and What They Do* (March, 1956) excellent. However, I still have difficulty understanding your magazine advertisements: for example, this one for shutters:

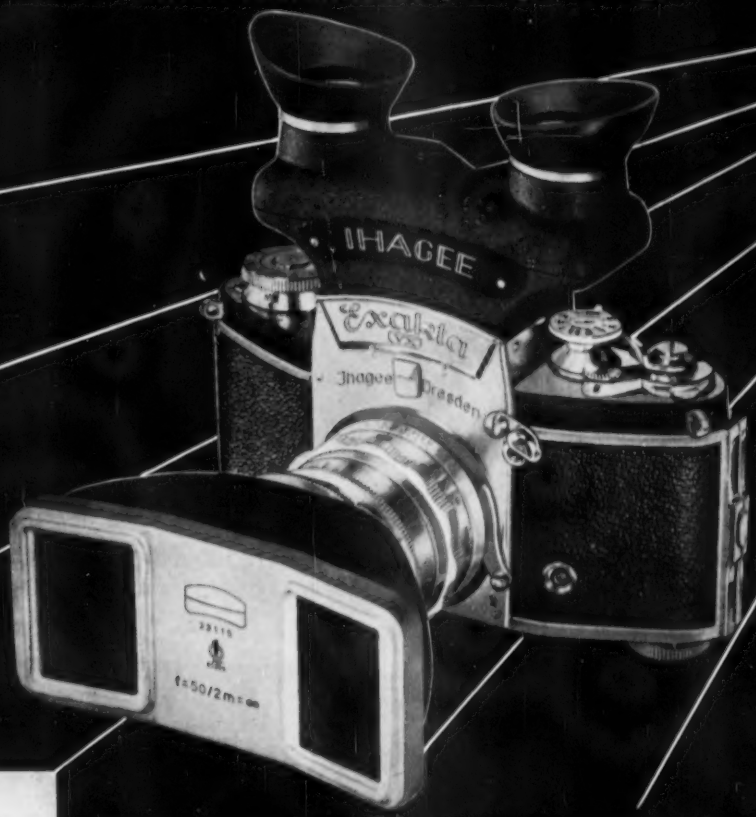
M-X Synchro-Compur
Optiper M-X Precision
Synchro Compur LVS
MFX-Synchronized.

IVAN R. ESTUS
Miami, Oklahoma

• *All 4 of these shutters can be used to make synchronized flash and electronic-flash exposures at all of the engraved shutter speeds. For Class M flashbulbs the selector lever is placed on the M, for electronic flash on the X, and for Class F flashbulbs (the SM and SF, which have a 5 milli-second delay) on the X or the F setting. The Synchro Compur LVS shutter has the Deckel light-value system.—ED.*

Now...for the first time in photographic history...

you can preview your Stereo pictures in 3-dimensions, before you take them! This is possible only because of Exakta's inimitable, unique design!



Exakta's ingenious Stereo Unit instantly converts Exakta cameras for 3-dimensional photography. This permits you to take 2-dimensional and 3-dimensional pictures of the same subject on one roll of film, and switch from one to the other at will, without an instant's delay!

1. Stereo Device A is for taking 3-dimensional pictures at a distance of six feet to infinity. Attaches to your picture-taking lens.

2. Stereo Device B is for pictures of small objects. Provides a quick and convenient means for taking close-ups in 3-dimensions from a distance of six inches to six feet. Secures to picture-taking lens and has a rotary adjustment for its two prisms.

3. Stereo Viewfinder is designed on entirely new concept. It makes possible previewing your pictures in 3-dimensions! Stereo Viewfinder is interchangeable with penta prism and waist-level viewfinders of Exakta XV and V, and becomes an integral part of the camera.

Stereo Device A	$139.95
Stereo Device B	103.50
Stereo Binocular Viewfinder (3-Dimensional)	59.50

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New AO EXECUTIVE

(FOR 2 x 2 SLIDES)

Eliminates Eyestrain

Most talked about new feature in slide projection . . . RESTLITE FILTER

"Wonderful" say guests. *"Terrific"* says the trade

Ordinary slide projectors use a shutter arrangement between slide changes which completely blacks out screen. Frequent changes from the brightness of projected pictures to total blackout between slide changes cause eyestrain.

Now after years of research by American Optical, a projector incorporates this revolutionary new feature, RESTLITE FILTER.

No more complete blackout between slides. Instead you get a uniform light scientifically selected for intensity and color to provide "Balanced Vision" during slide changes.

Your friends will all sit up and take notice when you project your slides with the new AO EXECUTIVE. Stop in and see it at your favorite store today.

MORE BRILLIANT PICTURES
. . . all new optical system. Big new precision ground f/3.5 5" focus lens, coated with the exclusive Americote process, gives truly professional results. Superior condensing system for greater illumination — guaranteed against heat breakage. Entire condensing system can be easily removed and opened like a book for easy cleaning.

HANDY CONTROLS
. . . with panel board styling, are readily accessible for ease of operation. Light switch, blower switch, and automatic changer are all within fingertip control. Centralized controls eliminate awkward reaching around or over projector.

NEW UNIVERSAL "40" SLIDE TRAY
. . . holds 40 slides of all type mounts. Accommodates the results of two (2) complete rolls of film. Provides permanent indexed slide file. Trays are low in cost, and are made of heavy, durable plastic.

SUPER STYLING
The new low silhouette look is years ahead in projector styling — makes everyone take notice. (You'll be amazed at the compliments you get for having picked the new AO EXECUTIVE.) In either 300 or 500 watt models.

OLD WAY

Frequent changes from brightness to blackout to brightness cause eyestrain.

PICTURE BLACKOUT PICTURE

NEW SCIENTIFIC WAY

Increases viewing pleasure and comfort by uniform light between slides — eliminates eyestrain.

PICTURE RESTLITE FILTER PICTURE

AO EXECUTIVE 300 — 300-watt $69.50 with deluxe carrying case $77.50

AO EXECUTIVE 500 — 500-watt $76.50 with deluxe carrying case $84.50

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$249.95

The 90-mm. Makro-Kilar is a superb optical and mechanical achievement. Its critical definition, excellent color correction and contrast are due to the use of rare earth elements in the production of the optical glass, combined with the skillful design and painstaking workmanship for which Kilfitt is world-famous.

All the latest refinements are built in, including preset diaphragm mechanism, click stops and lens shade-filter holder. The mount has a complete set of scales to simplify picture taking, including depth-of-field, subject-to-image (reproduction) ratio and exposure increase-factors.

The Makro-Kilar is designed for all popular 35-mm. and 2¼x2¼ single-lens reflex cameras. It can also be used with the Leica and similar still cameras (with Kilfitt reflex housing), and with 16-mm. and 35-mm. movie cameras. It is available with either the Basic Kilar mount, which will fit a wide range of different types of cameras simply with interchange of adapters, or Hasselblad mount.

FREE TEST PLATE

Each long focal length Kilfitt lens comes with a factory test plate showing it has passed the most rigid photographic and visual tests. Everything you may want to know about the quality of the lens, including resolution, is revealed on the plate. An 8x magnifying glass is included.

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7303 Melrose Ave., Hollywood 46, Calif.

COLOR CLINIC by David B. Eisendrath, Jr.

A famous technician solves your problems

In this column some months ago we published, without recommendation, the names of several places that claimed they would process Agfacolor Reversal Film. Some people have written to report unhappy results and experience with the California processor we mentioned. Several others have written to give the suggestion that such films be returned to Agfa in Germany for processing. M/Sgt. Wallace Snyder, USA, was kind enough to tell of his very satisfactory experience with this service. He says he mails his Agfa film by air mail, enclosing the equivalent of DM 1.40 (which is about forty cents) and requests that it be returned air mail, and within ten days he receives his transparencies unmounted in transparent sleeves. He says there has been no problem with customs and that the processing cost was included in the original cost of the films. Although there are authorized laboratories for this processing in England, Holland, and other European countries, he suggests that Americans who have picked up Agfa Reversal Films send them air mail to: Agfa-Umkehr-Dienst, Frankfurt A/Main—Rodelheim, Parkweg 22, Germany. Many thanx, Sgt.!

There is a color-finishing laboratory in Mexico which has been authorized by the manufacturers of Agfacolor Film in Germany to process Agfacolor Negative Film. The firm is Laboratorio Fototecnico, Jose de Teresa 151, Mexico 20, D.F. Orders can be sent airmail custom free, prices being paid in Mexican currency. Incidentally, this firm has been handling on an exclusive basis, all Agfacolor orders from Central and South American countries for the past several months.

Transparency vs Print Quality

I have been disappointed by the results of prints made from my transparencies; the results often have an overcast, colors that appear excellent in the transparency are not good in the prints, and the prints are frequently not sharp. Why?—R.C.H., Kitimat, B. C.

This is a question that comes in at least once a week, and one we have answered before. In the first place when top-quality professional color prints are made, they are prepared by a process using color separations where masking and correction for color contamination can be controlled. These prints are VERY expensive; but they are good. Prints made for amateur use which are the ones referred to in these questions are made inexpensively in a simple one-step operation. The materials are frankly incapable of producing accurate and true color all through the picture. The transparency is viewed by projection; it looks excellent. The print is observed in a lighted room and examined close up; the color can not compare with the brilliance achieved by the projected picture. In the projected picture, you can see a long range of contrast which you do not have in the print. When the print is made the printer has to make a compromise as to just what color and detail of the picture he thinks is the most important one and tries to make the print show this detail in good color. And, again, there are printers and there are printers!

NOW, I hope I won't have to answer this kind of question too often. Some of the new color-print materials that will be on the market soon give every indication that we soon will have marked improvement in inexpensive color prints. Samples I have seen have been excellent and I hope they'll be available to everyone, soon.

Time-lapse Movies of Sunsets

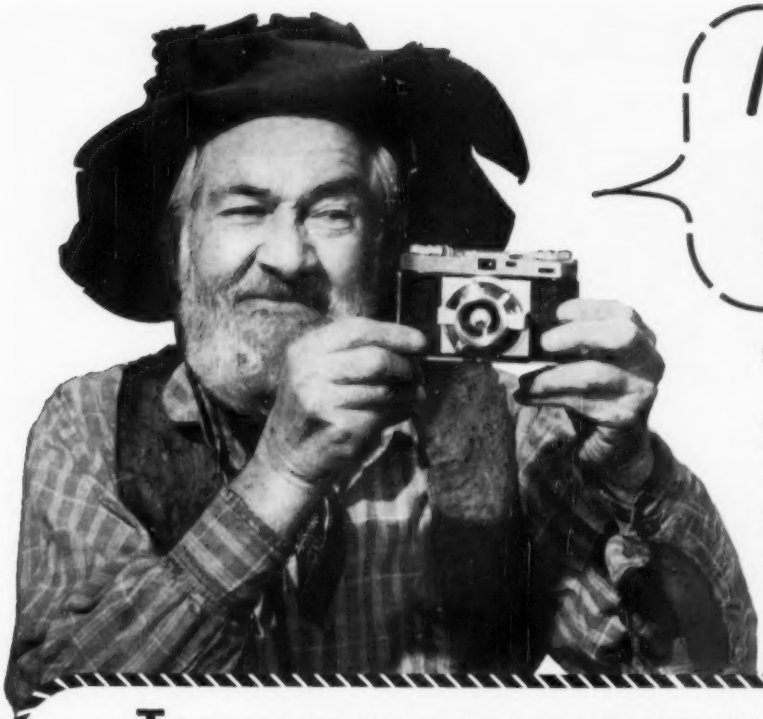
How can I photograph sunsets in color on my movie camera and show the changes in color of the sunset?—K.McV., Springfield, Mass.

Motion pictures of color sunsets are very effective. Exposure, of course, depends very much on brightness of sky and clouds and just what you want to record, and as in still pictures of sunsets a little exaggeration in color will only add to the drama. Here is a rough exposure guide suggested by Eastman Kodak, and you can make adjustment for other kinds of color films by calculating their speed relationships from those given here.

There are a couple of effective ways to shoot sunsets in color; a series of uniformly timed pans made every five minutes is probably the easiest but if you have a tripod and a moderately wide-angle lens, one wide enough to take in the whole spectacle, a very impressive picture can be made by exposing two or three feet of film (or short bursts timed with a good watch) every four or five minutes from about fifteen minutes before sunset to the late afterglow. If you have the camera firmly anchored, you will see the slowly changing color effect. You may even want to open up the lens a little as it grows very dark, but don't overdo it; let nature make its own record. This makes a wonderful finish for a travel or vacation movie, by the way.

You probably know how to do this, but if you use the time method I suggested and want to expose just two feet in each burst, use this as a guide: 8-mm film 16 fps, 2 feet takes 10 seconds; 16-mm film 16 fps, 2 feet takes 5 seconds; 16-mm film 24 fps (sound speed), 2 feet takes 3⅓ seconds.

Questions of general interest to the color photographer will be answered in this department. However, individual replies can not be given for questions that are not used.—Ed.



I CHOOSE EDIXA!

says GABBY HAYES

Gabby Hayes, Famous Motion Picture Star and Television Personality, owner of an Edixa Rangefinder Model C says, "I get perfect pictures in color everytime with my Edixa. For sports, action, portraits, candids and flash, you can't beat my Edixa!"

There is a wonderful feeling of pride and self-esteem which comes with owning an Edixa Rangefinder C camera. The Edixa C imparts the fine qualities typical of German craftsmanship, and bears the lofty and propelling spirit of leadership and true originality. Prominent personalities in all fields, people of discriminating taste, know that the finest precision cameras are made in Germany—the heart and cradle of the world's photographic industry. Little wonder that owning an Edixa assures you a lifetime of photographic pleasure and satisfaction.

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  The Isconar F/2.8 color-corrected lens renders fine crisp, clear pictures everytime.
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  Excellent flash pictures in color and black and white can be taken very easily as the Edixa is internally synchronized for flash.
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35-mm TODAY by Bob Schwalberg

Film-speed ratings: the high cost of safety

The changing attitude toward published film-speed ratings, and the increasing reliance upon indexes materially higher than those recommended by the film makers, is one of the most interesting and highly significant evolutionary processes in photography today.

Starting with the rebirth of interest in 35-mm available-light techniques after the war, this trend has progressed through three identifiable phases. In the first, it was "discovered" that pictures of a sort could be made with astronomically high speed ratings when development was forced. This was the era of grain and gloom, and technical standards plummeted to a probable all-time low. A reaction against ridiculously poor print quality brought about the second stage in which higher-than-recommended (but less than astronomical) speed ratings were coupled with more gentle development in order to obtain reasonable speed with acceptable quality. These initial stages were motivated by the need for faster shutter speeds and smaller lens openings. The price for pictures with less movement and more depth of field involved higher contrast, more grain, and some loss of shadow den ity. Although these losses became relatively insignificant as the value of soft-working but relatively energetic developers like D-23 and Promicrol became increasingly appreciated, they were nevertheless acknowledged. Finer grain and less-harsh contrast could have been obtained with more generous exposure and less pushing in the developer. Then came the new films and the third phase of this trend toward high effective film-speed indexes in which we find ourselves today.

These new high-speed, medium-speed, and slow-speed thin-emulsion films profoundly changed the situation. Giving less than the recommended exposure through higher effective film-speed settings on the exposure meter ceased to be an optional means to an end for which some quality must be sacrificed. Instead, these ratings have become a means for improving negative quality, and for the very high-speed films they are absolutely necessary.

Assuming some validity for the exposure and development data given with these new films, underexposure and normal or very slightly more than normal development is the key to technical success. Grain is finer, contrast and gradation superior, sharpness considerably improved, with more than adequate shadow density and detail separation.

The method used to arrive at the indexes that are finally published is very largely responsible for this condition. The American Standards Association (ASA) system used in this country is, in nontechnical language, based upon finding the exposure which will yield the minimum density and contrast required to produce a negative from which an excellent print can be made. This exposure is then padded (by reducing the numerical speed index) in order to provide maximum exposure latitude, and again, to help insure full normal exposure by making accidental underexposure less likely.

Without either damning or disparaging what is almost universally recognized as the most logical rating system ever devised, at least two things are fairly obvious.

The first is that if the exposure is increased to provide the safety factors, any negative exposed according to the resulting rating must produce more density than is absolutely needed to yield an excellent print. Increased density means increased graininess. Moreover, when this extra density is caused by exposure we introduce two additional disadvantages. The more we expose, the more we permit the random scattering of light rays within the emulsion (irradiation). These stray light rays make photosensitive crystals which bear no relation to the optical lens image readily developable, thus undermining sharpness. In addition, excessive exposure automatically lowers contrast, which is especially undesirable when the film is inherently flat, as are most of today's emulsions, save for the thin films.

DuPont S-X Pan rated at 1,000 and 16-min Promicrol development allowed film to see more than photographer. Exposure 1/25, f/2.8

Secondly, even if you agree that the safety factors are desirable for the benefit of the vast majority of camera users who may have little knowledge of photography, employ equipment which is inaccurate or poorly calibrated, have a careless attitude toward exposure, or invite disaster in other exciting ways, it is perfectly obvious that the less the safety

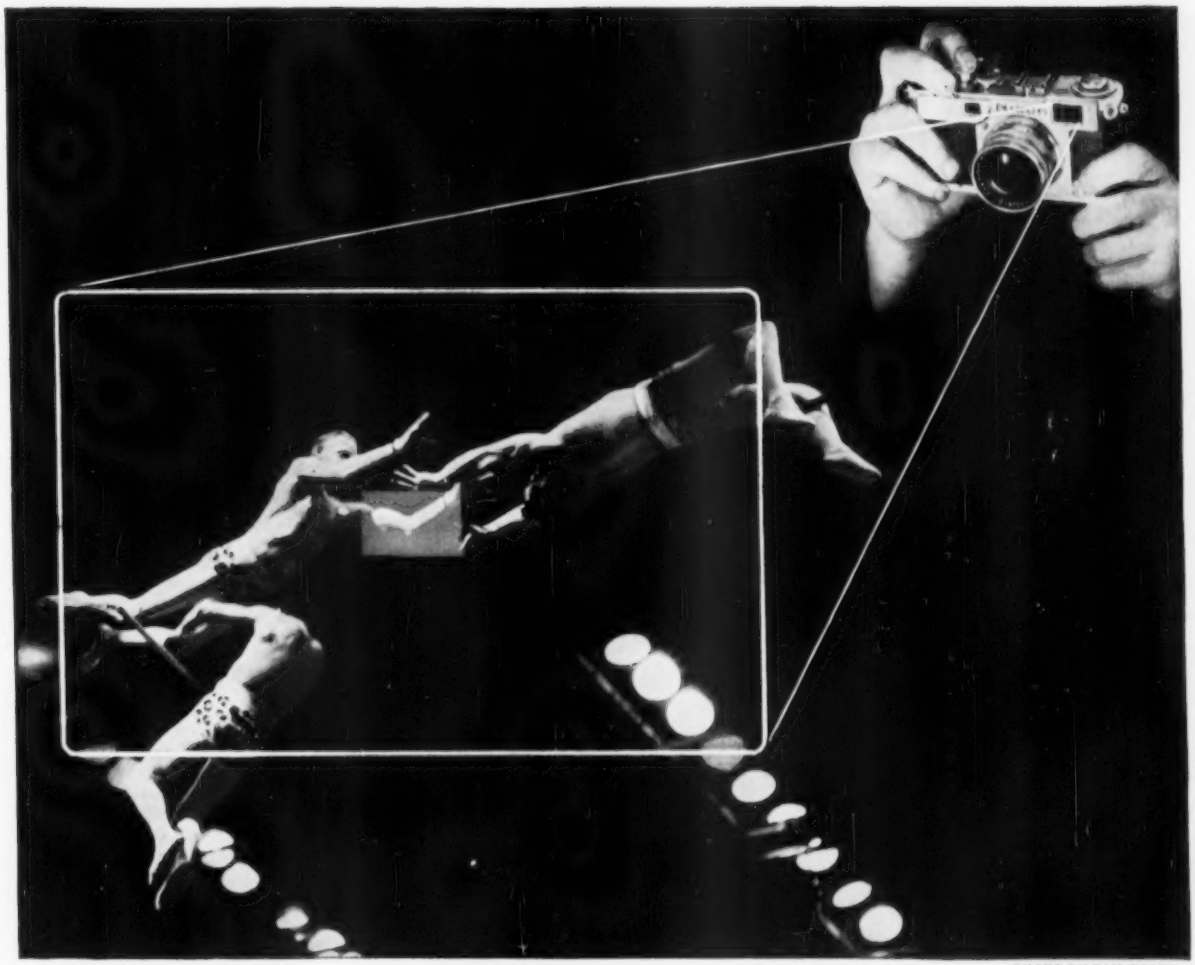

PHOTO BY RAY SHORR

How the Life-Size Finder Helps Make the **NIKON S-2** *the Fastest Handling '35' in the Field*

The first thing most people do when they pick up a camera is to look through the finder. Almost instinctively, they realize its importance — to spot the picture, compose it, . . . and to focus. For when you have your picture in view, composed and in focus — the rest is just a matter of releasing the shutter.

That's why the Nikon finder will make such a difference in your work. **The image is life-size.** You will focus faster and compose more quickly. You will even learn to do both simultaneously — for the viewfinder and the rangefinder are combined.

When the eye has to accommodate itself to a smaller-than-life-size image, there is a momentary lapse, and you may lose that timing, so vital to 35mm photography. The Nikon S-2 finder with its unique one-to-one optical system eliminates this condition.

The finder is only one of the reasons for the handling ease of the Nikon S-2. The controls are conveniently grouped at the top of the camera. You can advance the film, focus the lens and release the shutter using only three fingers. And you can do these three operations in as little time as it takes to say: advance — focus — shoot. Try it yourself!

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factor, the more accurate the exposure in terms of the film's true emulsion speed, and the better the potential result. The advanced film speeds used by experienced photographers today provide adequate latitude for anyone who uses an exposure meter with reasonable care. Even the tightest squeeze of the slowest and most-contrasty thin emulsions is about equal to the latitude of color films, and 35-mm color shows no signs of unpopularity due to any requirement for skill in exposure. It is also doubtful that any save the complete novice or mentally defective would be satisfied with results obtained from very much greater exposure errors than are tolerated by the new films at high effective film speeds.

The acceptance of increased effective film-speed ratings is not confined to any cult of wild-eyed extremists lurking about coalbins in the dead of night waiting for black cats, as some sensitometrically inclined people would have us believe.

In a recent bulletin, for example, *Modernage*, the well-known New York custom photofinishers, advised their critical professional clientele that the ideal rating for Tri-X developed normally in D-23 is 400 in tungsten light, or less than 50% of the recommended exposure. And they added: *"A word of caution: Do not expose Tri-X at less than 600 when using it outdoors."*

In a memorable ad published last January, the Eastman Kodak Company explained: *"The Panatomic-X exposure indexes are 25 daylight, 20 tungsten. These, however, include the usual safety factors to insure full normal exposure. Finer grain is obtained with a correct minimum exposure that just retains shadow detail. This means that with correctly adjusted equipment, you can adopt a daylight index of 50."*

The manufacturers of such excellent compensating developers as Neofin and X-22 both advise rerating of thin-emulsion films from one half to one full stop faster than their nominal ratings. In their detailed X-22 instructions, for instance, F.R. advises rating Adox KB-17 and Panatomic-X at 50 to 64.

But the most amazing abandonment of the traditionally sacred safety factor has occurred in Germany where Agfa has recently released a new high-speed film. Called Isopan Ultra, it is packed with a data sheet destined to be read round the world. Translating the German DIN ratings into their accepted ASA equivalents, this is what the customer is told:

This film is rated at 160.

For best results in daylight, expose at 320.

In tungsten light expose at 640.

Let's forget for a moment the unusual recommendation to rate the film faster with tungsten illumination than in daylight. This is due to the film's high red sensitivity, and an opinion (with which I strongly disagree) that subjects in tungsten light tend to be flatter than those encountered in daylight. This may be true of much studio lighting, and indirect bounce techniques, but it's almost never true in available light, aside from

(*Continued on page* 122)

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By
BOB TAYLOR

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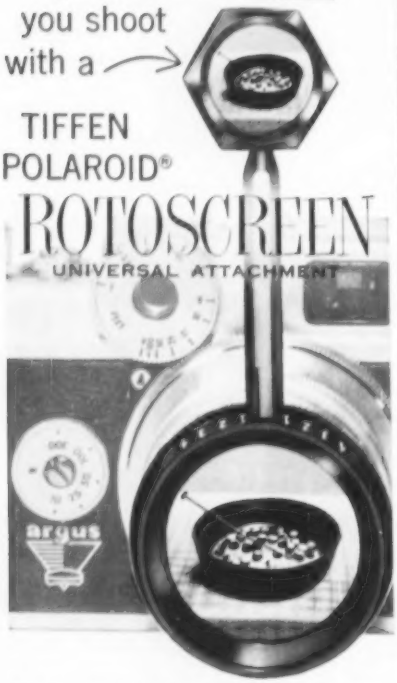

This important attachment controls the one filter that does so many things with **all** film . . . eliminates unwanted glare and washed-out color, darkens blue skies with color film without affecting surrounding colors, shoots **clearly** through glass and water, discovers detail and texture even your eye can't see. . .! And if you shoot movies, it is the finest fade-in, fade-out device ever made. With the ROTOSCREEN, you **control** the degree of polarization desired, and you see the result **before** you shoot. Simply fits on your filter adapter ring, Series No. 5, 6 or 7.

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CAMERA CLUBS by Whit Hillyer

Sort of amuses an old gaffer like me to read all this dewy-eyed club copy about the Minox camera. You see, back in 1940 or so, the Pop Photo staff got hold of one of the first Minoxes to come over from Latvia. We tested it, and found it to be just the compact, precision-made little unit it was claimed to be. Funny thing, though—we'd only been playing with it for a week when a G-man appeared in the office, politely asked us exactly what use we were making of it, and—shall we say—impounded it for the duration. And Pearl Harbor a year away!

But there's more. Not long after this, a Dayton, Ohio, newspaper photographer appeared at the gate of hush-hush Wright Field. Had his Graphic in hand, of course, and the sentry told him nothing doing on pictures. "OK," said the photog, "but d'you mind if I take an exposure reading as long as I'm here?" No objection to that, of course. So the photog took the "reading" with the Minox. Had 4x5 glossy prints on the PRO's desk next morning, too. I've often wondered what happened to that sentry—and to that Minox, and that press photog.

Give Them a Good Start

Livermore (Calif.) *Camera Club* has come up with an excellent idea for simultaneously looking over prospective members and giving them a good push toward really constructive membership. The prospect must have been proposed by a club member. Then he is invited to bring in some prints or slides for noncompetitive analysis by the group. This shows the neophyte wherein he excels or errs.

The Greeks Have a Club for It

In Athens, Greece, the *Athens College Camera Club* recently got off to a promising start. A comprehensive year's program now is in progress, including lectures, demonstrations, and a print competition and salon to top things off. Club members engage in considerable photo-reportage, covering school athletic and social events, visits of notables, and other highlights of college life. Prints are posted on the college bulletin board each week.

Only college or high school camera club in all Greece, this group is collaborating with the *Athens Photographic Society* to raise amateur photographic standards nationwide. The Hellenes would like to hear from other camera clubs in the United States and Canada. Address them in care of club president David R. Constantinis, Athens College Camera Club, P. O. Box 175, Athens, Greece. (For your information, Dave writes a very readable letter in English, so don't worry about your alphas and omegas.)

Henry Miner to Tour West

Following the PSA convention at Denver this year, Henry C. Miner, Jr., color-slide expert of Riverside, Conn., is scheduled to present a program to seven California and Arizona groups. The presentation, entitled *From Color Snap to Salon Slide*, was given previously on two eastern tours. For details as to dates and locations of his appearances, write to the National Lecture Program office of PSA, which is sponsoring the tour.

New York Club Has New Quarters

First camera club in New York City, *the Camera Club of New York* has celebrated its 77th anniversary by moving into spacious new quarters at 101 West 48th St. Except for plumbing and heavy-duty carpentry, all work involved was done by the members themselves.

Included in the new facilities are six darkrooms (one for color processing, with registration boards for dye-transfer work); a workroom for film and print finishing; and a studio, with regular lights, speedlights, and an 8x10 studio camera with three lenses.

We hear in reviewing its first 75 years, *Boston Camera Club* had a very interesting piece in the "Reflector" telling what things were like in the old days. Portraits were made strictly by daylight, and on glass plates, too. But the club had three darkrooms and did all right. Had 117 members by 1895.

Binghamton (N.Y.) *Camera Club* has put in a rule permitting a member to submit a new print of a certain negative even though the original may have placed in a previous contest. The new print must carry a slip marking it as a repeater and describing the improvement made in printing. The judges then decide whether improvements are such as to warrant re-entry.

Good to get the copy of "Hot Hypo," publication of *Flathead Camera Club*, Kalispell, Montana. Keep 'em coming, will you, *FCC*? This is the first copy I've seen, and it's interesting reading.

The PSA Camera Club Committee has made available a print-exchange directory, listing eight clubs which have made available on loan, collections of members' prints. This publication is available to PSA member clubs only. For details on this and other PSA club services, write to Fred W. Fix, Jr., 5956 Sheridan Road, Chicago 40, Ill.

What a fine job Dr. Thompson and John Booz of the PSA motion picture division did on one editor who scoffed (in print) at PSA movie activity. I'm happy to find such politely articulate gentlemen running things for the division. When thus kept under control, righteous wrath is lovely to see.

Is your club on our mailing list? If not, please send name and address to: POPULAR PHOTOGRAPHY, Department 307, 366 Madison Ave., New York 17, N. Y.

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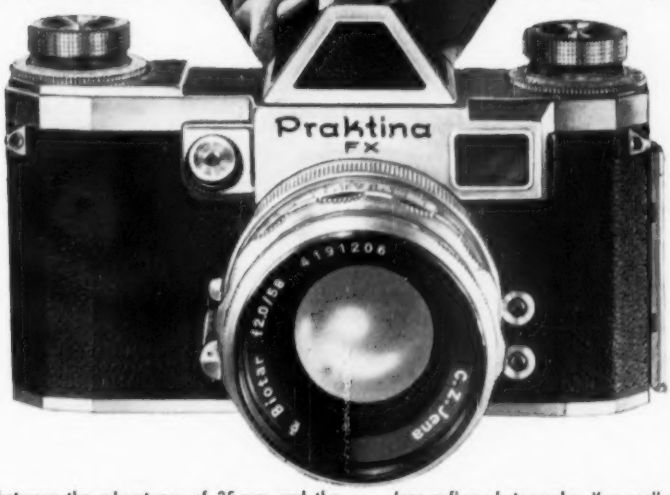

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No longer must you choose between the advantages of 35-mm. and the benefits of reflex photography when you select a camera. Because the Praktina FX is the one fine camera that does the work of two!

With the superb Praktina FX you get the speed, convenience and versatility of the finest 35-mm. camera plus the ideal composition and lighting control, through-the-lens depth-of-field visibility, freedom from parallax error, and brilliant-image, ground-glass focusing afforded only by single-lens reflex photography. You really see the picture you're going to get!

And the breathtaking photographic scope of the Praktina FX is complemented by an *array* of top-quality features unmatched by any other fine camera. Moreover, the Praktina FX is in a class by itself for simplicity of operation, picture-perfect security and foolproof construction.

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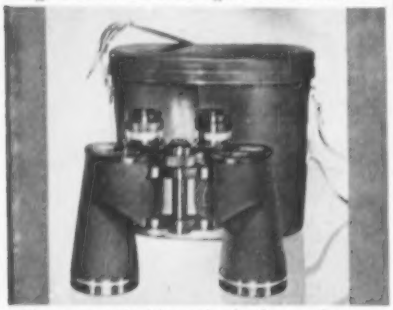


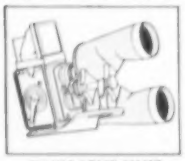
The fantastic idea of telephoto pictures thru Binoculars is now a reality. A new superb, photo-corrected Binocular works together with the normal camera lens, to record on film, enlarged pictures of distant subjects. D. P. Bushnell & Co., leaders in High Power, Precision Sport Optics, are the originators of this great development.

BINO-FOTO fits most Cameras

Fans all over the country are "stretching" their normal camera lenses with this marvelous, 7-power instrument to capture pictures they couldn't possibly reach before. Called the BUSHNELL BINOFOTO BINOCULAR, it attaches *quickly . . . easily* to practically any camera. Simple, practical BinoDapters align camera with binocular perfectly . . . rigidly. They are available for 35mm, twin lens; 8 and 16mm movie cameras. Lens power is increased 700%!

Users Everywhere Acclaim It

BINO-FOTO enthusiasts—thousands of them have proven the practicability of this compact, versatile, long focal length system. It brings all the exciting wonders of telephotography—'til now prohibitively expensive—to everyone. Best of all, these Binoculars are grand for all-purpose viewing too, and fully guaranteed for 20 years.



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Full data (illustrated) may be had at Camera Stores, or write D. P. Bushnell & Co., Dept. R29 Bushnell Building, Pasadena, Calif. . . . In Canada: 1333 16th W. Calgary, Alberta. *(Advertisement)*

STEREO TODAY by Robert L. McIntyre

The exhibition season which ended this spring probably will go down in history as the "Year of the Big Close-ups." Over and over again, awards in club contests and the salons went to pictures taken at short range. Even to one involved both as exhibitor and judge, it was hard to tell just what was happening. There is a chicken-and-egg relationship between acceptances by judges and slides offered by exhibitors. At first it seemed as though the judges were selecting close-ups, singling them out from among the many types of slides submitted. Later it began to look like they were being forced to choose close-ups simply because a large portion of the capable photographers across the country were submitting very little else.

An analysis of pictures accepted in the 1st PSA Traveling Stereo Salon reveals how far this trend has gone. Over two thirds of the slides in the show are limited in depth, do not show anything farther than 20 feet or so from the camera. Here is how they may be divided:

26% Close-ups (2½ feet or less)
28% Medium close-ups (2½ to 10 feet)
14% Medium shots (10 to 20 feet)
32% Distant views (to infinity)

No two photographers would come up with exactly the same figures, since such an analysis depends upon estimating distances in the pictures, but the general trend is unmistakable. There are shots that overlap these arbitrary groups to throw more emphasis on nearby objects. Many distant views, for example, contain strong foreground objects near the camera. It might well be noted that this surge of interest in close-ups is not restricted to stereo. You see it in the print exhibits and, much more, in color slide shows. Sometimes a group of plant or animal close-ups makes you wonder whether a color exhibition isn't a nature-slide competition.

The Near Viewpoint

It isn't always easy to recognize a close-up or to define one. The near viewpoint for shooting a moth may be 2 or 3 inches. For a person it may be 2 or 3 feet, and for a sports car 2 or 3 yards. Whatever distance it may be, it has many advantages. They affect planar pictures as well as stereo. It has been said that the things left out are just as important to the success of a picture as the things left in. Close-ups automatically limit subject matter. R. B. Doherty's *Dragon Mouth*, the accompanying illustration, shows how a portion of a blossom lends itself to well-composed simplicity. We all know how a whole garden may become a hodgepodge in comparison. Doherty's picture was accepted in the Traveling Stereo Salon, and was chosen slide-of-the-year in the Chicago Area Camera Clubs Association's first annual stereo competition.

Close-ups of small objects have their own particular appeal. The wing of a dragonfly, blown up to full screen size from a sharp transparency, reveals detail we aren't accustomed to seeing in real life. Stereo close-ups, taken with the aid of a slide-bar to get very short interlens distances, provide amazing 3-D views. We can never look into the heart of a rose for a real-life view that even approximates the picture good close-up stereo technique can give us—our eyes are just too far apart for both of them to see the same area at the same time. The technique of taking close-ups with single-lens cameras has been simplified for many amateurs with the rise in popularity of the 35-mm reflex. Some fans elect to shoot stereo close-ups with it, mounting it on a slide-bar and taking two full-frame 35-mm pictures. Part of the film is deliberately wasted to bring the transparency size down to fit the usual stereo format. Others work with stereo cameras and supplementary lenses.

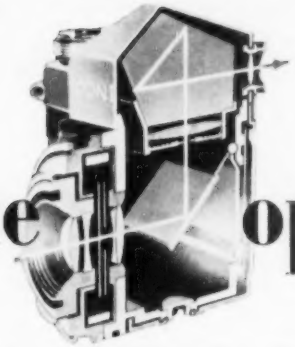
Even if you haven't the slightest interest in the exhibitions, there is plenty to learn from the trend toward close-ups that is apparent in them. You can gain impact by shooting extreme close-ups of any subject. Your pictures will improve if you limit the things shown in exposures taken at ordinary distances. Stereo's realism is enhanced when views are limited in depth. A backdrop of buildings, trees, rising ground, or plain sky is helpful if it keeps everything shown within a range of a few hundred feet. Too little depth is better than too much.

The tools for making stereo close-ups and the techniques for using them have become common property only recently. That probably accounts for the current trend. Once fans have mastered this particular form of stereo trickery, the balance probably will become more nearly normal. We will again see more distant views. Yet the lessons of the close-up will remain with us.

Sequence Contest Judging

If you're in New York September 14, you will be welcome at Metropolitan Stereo Club, which meets at the Architectural League, 115 East Fortieth Street, at 7:30 p.m. That is the night of the judging of the Photographic Society of America's stereo-sequence competition, sponsored by Emde Products, Inc., with $400 in prizes.

It's fun to learn more about your hobby, to see how your pictures stack up in competition, and to talk stereo with a congenial group. That is what Metropolitan was organized to provide. It meets the second Friday of each month.—



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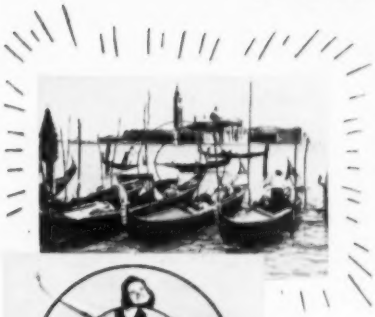
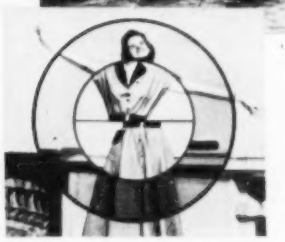


You use the Contaflex at eye-level—the *natural and convenient* way to sight and focus . . . You get a large bright view of what you are taking, and see it just as it will appear in the picture—you can judge composition, tone values and colors easily right up to the instant of exposure.



As you sight, you focus conveniently with both ground-glass and split-image rangefinder simultaneously. The split-image is invaluable when shooting fast or in poor light. For close-ups or when subject has fine detail, the ground-glass comes to your aid.

It's superb Zeiss Tessar f/2.8 45mm lens has the speed needed for pictures in almost any light without flash. Inexpensive supplementary lenses permit close-ups to 6″ with camera hand-held. *No parallax problem.* No extra focusing units needed.

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CANDID SHOTS by the Editors

Now—35-mm Every Month

Beginning in the next issue, we inaugurate a new and regular service to the growing proportion of our readers who use miniature cameras. Statistics—as well as the response to our own presentation of 35-mm articles—indicate a steadily ascending interest in small cameras. So, in the October issue and in every issue thereafter, you'll find a feature portion of POP PHOTO devoted to 35-mm photography. Kicking off the new series will be three valuable stories: *Getting the Most from 36 Exposures, How to Read a Contact Sheet*, and a report on two new lenses for 35-mm cameras. Even if you use a larger camera you'll find the series profitable; if you own a 35-mm camera, it will be indispensable. Watch for it, beginning in October!

Color, Color Everywhere

As the cover loudly proclaims, this September issue is devoted to color, and it has lots of extra four-color pages to delight the eye and stimulate the imagination, as P. T. Barnum or somebody used to say. At any rate, here is a real circus of color—everything from selecting color film to selling finished transparencies, including such subjects as processing your own color film without a darkroom, retouching to correct errors in lighting and exposure, how to make Flexichrome prints, and color by night. There's a portfolio of the pictures of Bert Stern, color illustrator who has parlayed high fashion and vodka into good business and a top reputation. Altogether, a stimulating and rewarding issue.

"Color Doctor" on Retouching

Mike Lavelle, who passes along some of the secrets of his specialized craft in our exclusive story, *Color Retouching* (pages 38-43), first gained recognition as a color consultant and photographer for *Time* and *Life*. He was largely responsible for innovations in technique and procedure that led to improvement of color quality in all Time Inc. publications. At the same time he took many cover and inside color shots, and was always called upon when color fidelity was a problem. Time Inc. founded and financed Lavelle's lab, Authenticolor, to exploit and perfect all the color processes. Now it offers its services to all comers, and among its clients are most of the leading magazine publishers, and numerous advertising agencies and industrial concerns. One of the numerous unique features of the Authenticolor operation is the Colortronic camera, part of which appears with Lavelle in our picture. It's called the world's largest camera, and it may easily be, for it is shaped like a railway car and nearly as long. Colortronic's function is to produce one-shot "colorstats," direct-positive paper prints as large as six feet, without intermediate negatives. This enables the lab to furnish a copy print from any color original in a single day. The giant instrument was designed and developed by Lavelle himself, in conjunction with optical and mechanical engineers.

Lavelle and Colortronic

New Industrial Scholarship

Ralph Baum, head of Modernage laboratories, a New York professional processing concern, has shown his gratitude to the world of the camera by establishing a scholarship in industrial photography in his name at Kent State University, Kent, Ohio. Initial winner of the award is George Kolbenschlag, already a student at Kent.

PSA-Time in the Rockies

Here it is time again for the annual convention of the Photographic Society of America! This year the big meeting will be held in Denver, September 26 through 29, and 2,000 members are expected to attend. Lined up to address the assembled multitude are Harold Lloyd, Tullio Pellegrini, Glen Turner, Dr. Harold Lutes, Harrison S. Fisk, and numerous other experts in all the fields of interest of PSA's divisions. There will be the usual big, beautiful, and prestigious picture exhibition, and (also as usual) a great time will be had by all. We extend salutations and good wishes to the PSAers as they convene in cool Colorado.

Fifty Thousand to One

William Gallinson and 50,000 other people wrote their names on little slips of paper and dropped them into a box at the POP PHOTO booth at the recent National Photo Show in New York. The 50,000 never heard any more about it, but Gallinson did; he heard he'd won the bright red Austin-Healy sports car that occupied the center of the booth. He reacted just about as you would have: incredulous at first, then delighted. The 39-year-old stockbroker, who lives in Passaic, N. J., was formally presented with the sleek $2,985 machine by William Ziff, Jr., of the Ziff-Davis Publishing Company.

Gallinson (in his car), and Ziff.

Department of Desperation

Sometimes our contributors express understandable disappointment that we can't give them detailed criticism on pictures and stories that we return to them. One ingenious fellow in the armed forces attempted to pin us down; with a selection of color slides, he enclosed a card headed, "Check one or more and return, please." There was a row of boxes down one side, with these alternatives:

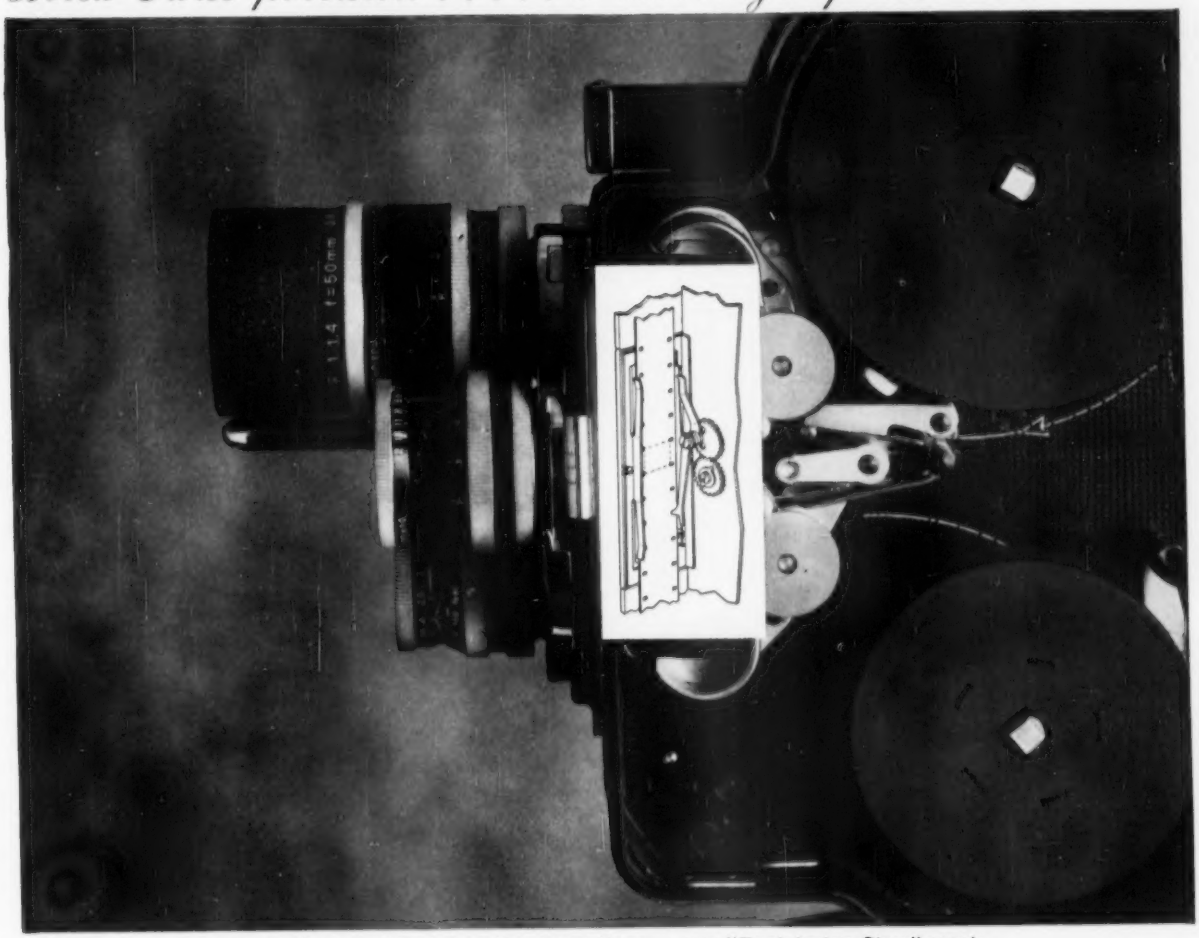
Good, but not good enough
Fair, try again in 5 years
Superb; sorry we can't use them
Whooee—go back to black-and-white
Perhaps you should take up the yo-yo
Nice mounting job, very neat
Check enclosed for $——

Trouble was, none of the lines exactly fit his pictures; we couldn't decide which box to check. But we kept the card, anyway.

Old Timer Changes Hands

One of the most venerable of U. S. photographic manufacturing concerns, Graflex, Inc., disclosed recently that its controlling stock will be acquired by the General Precision Equipment Corp., a colossus among whose other subsidiaries in the field are Simplex, Ampro, and SVE. Under the proposed setup, Graflex management will remain the same, and the product line will be broadened. Construction of a new Graflex plant in the suburbs of Rochester is proceeding on schedule, with completion due in 1957. It's a grand old name, and long may it wave, on whatever banner.—

Bolex Swiss precision . . . . . a marriage of skill and science



Inset diagram illustrates the revolutionary new "Registrator Claw" mechanism—now a standard feature on all 16mm and 8mm Bolex H cameras.

new built-in pinpoint steadiness . . .

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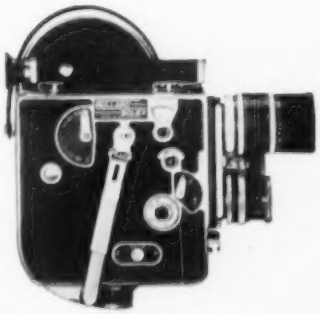
The Swiss-precision Bolex now brings you another great new exclusive feature—*pinpoint steadiness.* The revolutionary, patented "Registrator Claw" guarantees you professional, rock-steady filming. This is not merely another accessory—it is a *built-in* feature of all 8 mm and 16 mm Bolex H cameras. And no other camera has anything like it.

The Bolex "Registrator Claw" eliminates all film flicker by maintaining constant control on the film as it passes behind the shutter. The special movement of the "Registrator Claw" is vibration-free. Each frame is positioned with Swiss precision in proper relation to the preceding and subsequent frames —and remains in this precise registration even when the film is wound back and double-exposed for special effects.

In addition to this unique *pinpoint steadiness*, all the cameras of the Bolex H series have these superb features — 3-lens revolving turret, eye-level focus, parallax-corrected viewfinder, speeds from 8 to 64 frames per second — and others characteristic of the finest Swiss craftsmanship.

The fine cameras in the H series — 16 mm and 8 mm—are priced from $269.50 (including Federal Excise Tax).

See these cameras demonstrated at your Bolex Franchised Dealer and at the same time ask to see the informative Bolex Reporter magazine. For the name of your nearest Bolex Dealer and literature on the Bolex H cameras — write Dept. PP9, at the address below.



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COLOR

A POPULAR PHOTOGRAPHY SPECIAL ISSUE

THE COLOR-FINISHING MUDDLE

—an editorial

WHEN the Department of Justice, in an anti-trust consent decree worked out with the Eastman Kodak Company, put an end to the practice of including processing charges in the purchase price of Kodachrome film, the news took awhile to filter down through the ranks of the millions who had grown accustomed to the easy routine of stuffing their exposed Kodachrome film into the yellow cloth bag, addressing the tag, and dropping it in the mail box; but when it did, the reaction assumed the momentum of a ground swell. Protesting letters poured into the Attorney General's office in Washington, people wrote to their newspapers, and newspapers wrote editorials siding with the irate slide and movie makers. One newspaper, *The Knickerbocker Evening News* in Albany, N. Y., stirred up a post-card crusade urging the Justice Department to junk the decree, and *The Wall Street Journal* devoted more than three full columns to an analysis of the chaotic situation.

What was the Justice Department trying to do? "Generate more opportunities for the business world and more opportunities for the consumer," said Assistant Attorney General Stanley Barnes, which didn't make much sense to the Kodachrome user who now had to make three trips to the photo-supply store: (1) to purchase the film, (2) to leave the cartridge for processing and (3) to pick up the finished transparencies. To make matters worse, he had to pay more under the new dispensation than was the case when Kodak did the whole job by mail and included processing service in the purchase price. Before the decree, for instance, a 20-exposure roll of 35-mm Kodachrome cost $3.25, including processing. Today (as this was being written) a 20-exposure roll costs $1.85, and the processing, which is now handled through the dealer, costs $1.50 for a total of $3.35, ten cents more than you used to pay. In the case of Kodacolor, you pay 17 cents more than you did before the decree took effect. Where's the break for the consumer?

In these circumstances old, color-happy Kodachrome users had a perfect right to be sore, and the mild-mannered were entitled to be confused. The consumer seemed to have wound up with the short end by being inconvenienced and paying more for the privilege.

Most of this can be chalked up to the usual bureaucratic bumbling. The government's intentions were laudable enough, but the way in which the decree was handled was ineptly abrupt to say the least. As R. J. Wilkinson, executive director of the Master Photo Dealers and Finishers Association, put it, "the Justice Department might have avoided much criticism if it had made the effective dates of its decree more gradual."

But the mistake was made and the confusion followed and probably will continue for some time. Eventually, unless overwhelmed by consumer protests, the Justice Department's intentions—to open the color-finishing field to competition—will probably be realized. As an immediate result of the decree Eastman Kodak released its formulas and methods and is currently in the process of licensing other photo finishers to process its films, including the complex Kodachrome. Large independent color finishers have already entered the field of Kodachrome and Kodacolor processing, some of them on a national scale; and eventually hundreds of smaller, local operators are expected to join the party. If all goes as well as the government hopes independent color finishing will be as flourishing as black-and-white now is, and the thousands of retail outlets—camera, drug, stationery, and department stores—across the country will be free to determine whether to send their customers' color film to Eastman Kodak or an independent processing lab.

The color-finishing field was thus suddenly thrown open to full-scale competition before the potential competitors had time to learn the business and acquire the expensive equipment necessary to handle it. But when all these new finishing plants are thoroughly shaken down, the incompetents shaken out, and the machinery of distribution perfected the color photographer stands to gain more than he lost. As competition builds—and it is building rapidly—processing prices will probably go down and service will improve. Fast service, possibly even on a twenty-four-hour basis, will probably appear, and already some companies are offering a mail-bag service which enables the consumer to deal directly with the finishing lab, thus healing the sorest wound inflicted by the consent decree.

Mark all this down as normal growing pains in color photography's healthy progress towards maturity.—*B.D.*

OVEREXPOSURE

LOCAL AREAS WEAK

LACKS YELLOW

EXCLUSIVE FIRST!

COLOR RETOUCHING

A pioneering technician reveals professional secrets you can use to improve faulty transparencies

By MIKE LAVELLE

Photographs by the author

Flesh tones in left picture are too magenta, but transparency was thin enough to permit addition of a complementary color (yellow) in the form of water-soluble aniline dye.

(The author is director of Authenticolor Laboratories, New York, and a photographer specializing in solving color problems.)

TIME was when a color photographer looked at his processed transparencies and was forced to accept his results as a *fait accompli* — this was it. Modifying and retouching, as with black-and-white film, seemed an impossibility; unwanted imperfections were either accepted or retakes were necessary.

Even when retakes were possible, finished results were not always perfect. It seems that even the prettiest model may show up with bags under her eyes or straggling hairs, despite meticulous make-up and the greatest care in lighting. The impossible-to-retake transparencies may turn out over- or underexposed, off-color, lacking a certain hue or desirable skin tone, have washed-out highlight detail, unwanted backgrounds, or show light streaks, pinholes, or dozens of other imperfections.

Now these imperfections can be corrected as easily as with black-and-white film. In fact, professional retouchers have been doing it for years, each retoucher discovering and developing his own special tricks. Some of the techniques and formulas have been carefully guarded secrets but, by and large, the general methods and formulas used are fairly similar, and are common knowledge to all professional color retouchers.

Now, however, there are a few color photographers and technicians who have attained access to these so-called secret formulas and are very successfully using them to correct their own transparencies.

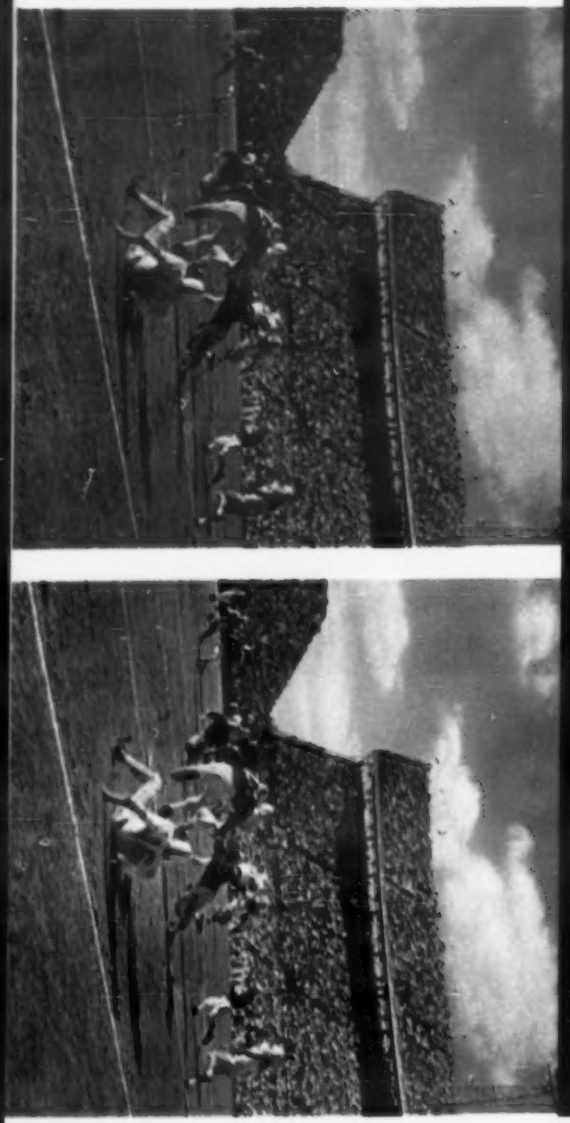
Shirts of both models in this shot were weak in color, so solutions of red and blue dye were applied with brush, and the process repeated until desired intensity was reached.

First step in determining what correction should be used on transparency is examination through various standard color-compensating filters; aniline dyes can match these effects.

All equipment and supplies needed for all the procedures mentioned in this story are shown here. For many of the techniques, only a half dozen inexpensive items are required. None of these retouching methods requires any previous special experience.

Thin transparency like the one at left indicates serious overexposure. Flesh tones, cap, and tiles in foreground were all strengthened by local application of dyes.

EXCESS RED



UNDEREXPOSURE

EXCESS BLUE

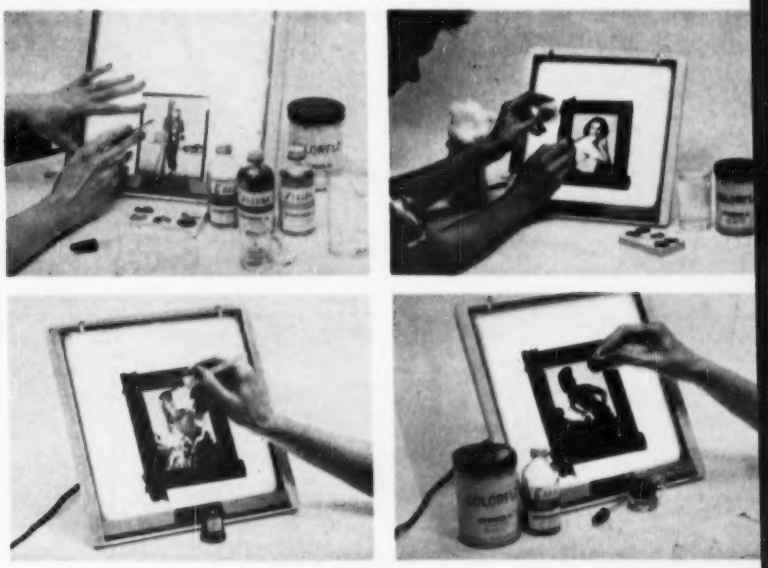
Since these color-correction methods are now coming into "public domain," and sooner or later will be common knowledge to all, I don't feel I'm revealing any well-hidden trade secrets in publishing these formulas and techniques.

Although minor corrections can be made quite easily, the more elaborate corrections take a lot of care and practice. It is always best to attempt correction first on an identical type of film of the same emulsion number before working on a valuable original. Manufacturer's standards in producing color film may change from time to time, and the chemical formulas published in this article may sometimes react a bit differently. This, however, is the exception rather than the rule.

Most of the chemicals, ingredients, and equipment described in this article are simple to obtain *(Continued on page 82)*

Shooting in shade without a filter often results in bluish cast, which can be removed with proper cyan bleach; for Ektachrome this happens to be a common developing agent.

Handwork steps are illustrated by light-box close-ups. Clockwise from top left: building-up of thin color in local areas with brush and weak dye; spotting pinholes or stippling larger areas with extremely fine pointed brush; adding color to a background with cotton swab; and application of lacquer to areas where color is not wanted in swab or immersion methods.



Backlighting exposure is tricky, often resulting in underexposure of important areas. The cure: successive bleaches for yellow, magenta, and cyan, in required proportions.

Immersion techniques are illustrated below. In same order: preparing dye in desired strength by mixing with water and wetting agent; bathing film in aniline solution; removing entire emulsion with ordinary household bleach, where large area is unwanted; and bleaching-out a single color by immersion in correct formula for particular kind of film.

Late-afternoon sun can cause a red over-all cast, remediable with a magenta bleach. All formulas are compounded with easily available chemicals from drug or photo store.

WRONG COLOR BACKGROUND

Backgrounds to order: this shot was made against white background; the variations made by masking all but background with lacquer or frisket (a special waterproof tissue paper), then immersing in dye of any color. If background were originally colored, it could be removed by Clorox bleach, using method shown on preceding page.

UNDESIRABLE BACKGROUND

Distracting objects can also be removed from backgrounds. Here objectionable wires were taken out and more attractive sky color was supplied by brush application of blue dye to back of transparency.

LIGHT STREAKS

Concealing light streaks made by reflections inside camera requires skill in blending color to match surrounding area, but if too much dye is applied to streak or pinhole, it can always be removed.

HOW TO CORRECT FAULTY COLOR TRANSPARENCIES

DEFECT

	Ektachrome E-1	Ektachrome E-2	Anscochrome	Kodachrome
Dense over-all (underexposed)	*Bleach yellow 1 min, magenta 5 min, cyan 1½ min, at 75 F*	*Bleach yellow 3 min, magenta 15 min, cyan 2½ min, at 75 F*	*Bleach yellow 2 min, magenta 3 min (2 solutions), cyan 3 min, not over 68 F*	*Remove lacquer, bleach yellow 40 sec, magenta 1 min, cyan 1 min, at 68 F*
		(Times based on correction corresponding to CC-30 filters.)		
Thin over-all (overexposed)	*Use color-compensating filters over transparency to see desired effect. Mix aniline dyes to correspond to color and intensity of filters, immerse film in dye. With Anscochrome and Kodachrome, progress is visible during immersion; Ektachrome requires trials with discard transparency. With Kodachrome, remove lacquer before beginning (see text). This technique does not work well in large highlight areas, which tend to become overcorrected.*			
Excess of one color over-all	*Bleach desired color, using times shown above. Experiment on discard if possible, since degree of bleaching is not visible during process.*		*Use above times as guide; color change can be observed during process.*	*Remove lacquer. Use above times as guide; watch color change during bleach.*
Lack of one color over-all	*Use appropriate aniline dye as for thin transparency, with total immersion technique. If highlights are overcorrected, some dye may be removed by soaking in water. Alternative method for Ektachrome and Anscochrome only: tape transparency to glass, with back surface exposed; apply dye with cotton swab. This way, color change is continually visible, as emulsion does not discolor.*			
Large areas "washed-out"	*Apply nail lacquer or frisket film to emulsion side in areas where no dye is desired. Immerse transparency in appropriate aniline dye as above. Remove lacquer with acetone. Most useful for correcting "bald" sky by use of blue dye.*			
Local areas "washed-out"	*Build up color where desired, using dye weaker than intensity required. Apply with brush, blot excess with moist cotton swab, repeat to get color value desired. Work on reverse side of film, except with Kodachrome, to avoid temporary discoloration of emulsion.*			
Unwanted background	*Apply nail lacquer or frisket as above, immerse in diluted hypochlorite bleach (like Clorox), which removes emulsion entirely. New color may be added on reverse side, by immersion or brush application.*			
Light streaks, pinholes	*Blend exact dye color required, build up streaked areas with weak dye and brush-and-swab technique. Spot pinholes with very fine brush point. Work on emulsion side with Kodachrome, reverse side with Ektachrome and Anscochrome.*			

PHILIPPE HALSMAN, photographer of 76 *Life* covers. "This should be cover No. 77," says Weegee.

YOUSUF KARSH, portrait photographer to the greats of the world. "I wonder why he won't photograph Weegee."

Most photographic caricatures are unsuccessful because the amount and kind of distortion rarely suit the features of the subject. In these recent caricatures Weegee has bypassed easy

WEEGEE'S

ALFRED EISENSTAEDT, distinguished photojournalist and long-time *Life* staffer. "Make like Liberace, I said."

VICTOR KEPPLER, commercial, advertising photographer. "What a cigar! He's a character like me."

exaggerations to arrive at nearly complete control of his refreshingly lunatic effects. On assignment for our editors, Weegee chose four understanding photographers as his victims.

Details of Weegee at work on page 77.

CARICATURES

OF FOUR FAMOUS PHOTOGRAPHERS

How to make

FLEXICHROME

full color prints By LYNN FAYMAN

Now that Flexichrome is established as the unique hand-coloring medium, why not try it yourself?

EVERY photographer has a favorite black-and-white portrait, landscape, or abstraction which he curses himself for not having photographed in color. Before Flexichrome film was introduced the only solution was a laborious hand painting process which at its best was a fair approximation of the vividness of natural colors. With the Flexichrome process colored dyes are applied by brush to a special three-dimensional gelatin image or matrix giving a depth and brilliance of color which is not only comparable to an excellent print from a color transparency but which allows you complete control over your use and choice of the hues and tints.

Now that Flexichrome has earned a niche for itself in darkrooms all over the country, let's take a look at some of the things that make it an attractive and creative technique with a wide range of controls and effects.

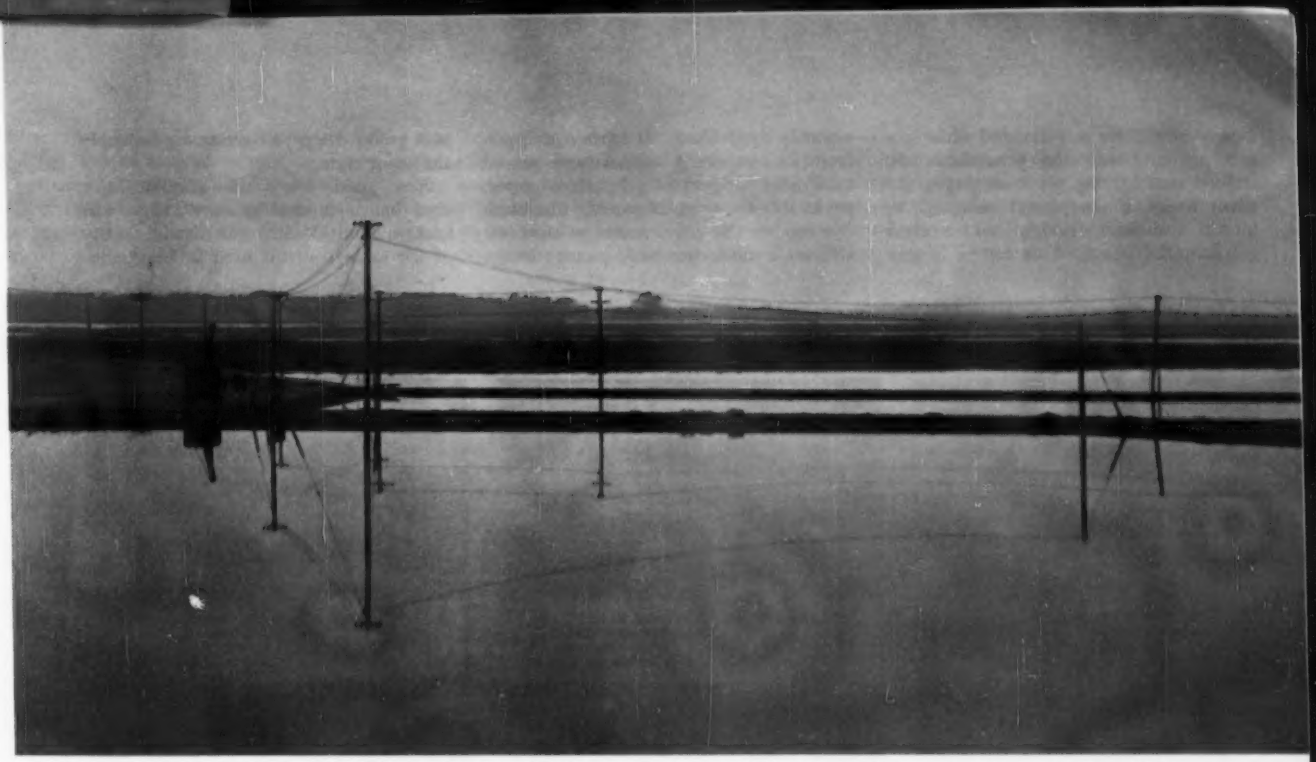
In the Flexichrome process a black-and-white negative is projected in your enlarger on a film consisting of a gelatin emulsion fastened to a thin film base which in turn is glued to a temporary transparent support. When this film is exposed and the image developed, it

MATERIALS YOU WILL NEED TO PREPARE A FLEXICHROME MATRIX

Six solutions are necessary in order to make your Flexichrome matrix. Four of them are special Kodak Flexichrome and matrix formulas; the other two are ordinary 2% acetic acid and hypo. Also shown: Flexichrome Stripping Film, dye-transfer paper, transfer sheet, and squeegee.

MATERIALS TO COLOR AND LACQUER THE FINAL FLEXICHROME PRINT

Around the prepared matrix are grouped the materials needed for coloring and finishing a Flexichrome print. These include masking tape, blotting paper, Flexichrome Print Lacquer and Lacquer Thinner, solution of 2% acetic acid, water, color dyes, brushes, and a palette.



Flexichrome process added these spectacular yet natural sunset colors to a landscape which in black-and-white would be just another picture.

A multiple photogram made directly on Flexichrome film served as the jumping-off point for an experiment in the abstract use of colors.

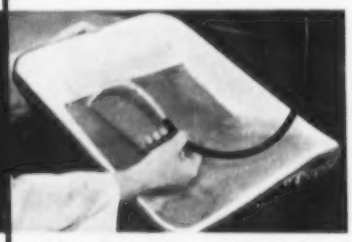
closely resembles a black-and-white paper print. Using the procedures described step by step on these pages, the silver image is completely removed by bleach and fixer leaving only a clear gelatin-relief image. This matrix is temporarily dyed black. It is then stripped from its temporary support and placed on a final support of gelatinized paper, preferably dye-transfer paper. The black dye models the relief image so that you will see a monochromatic picture image as a guide when you are ready to apply the color dyes.

Any good black-and-white negative that has a normal density range will make a good Flexichrome matrix. Many of the same controls used in black-and-

A STEP-BY-STEP REVIEW OF THE FLEXICHROME PROCESS FROM

1 Negative must be placed in a reversed position in enlarger since image is projected on the base of Flexichrome film (later flopped). Because there is little control in developing, exposure is critical.

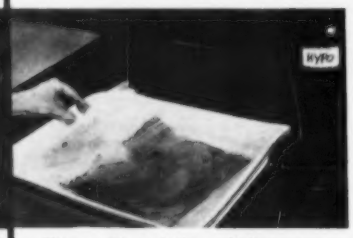
2 Develop two minutes at 68 F. Proportionate amounts of A and B tanning developer, rather than time, determine the contrast level.



3 Pour off developer and wash in 68 F water. Then use 2% acetic acid stop bath. After 30 seconds normal room lights are turned on.

4 The gelatin emulsion which has not been developed is washed off with 110 F water; rinsed at 68 F.

5 Bleach is now applied to the gelatin relief image for one minute. Silver image turns yellowish-brown. Wash film again at 68 F.



6 Film with gelatin relief image (matrix) is fixed in hypo for one minute. Silver image has begun to disappear in this illustration.

7 The fixer has completely eliminated the silver image, leaving nothing but the clear gelatin matrix. Wash for one minute at 68 F.

8 Place matrix in modeling agent dye bath for 3 to 5 minutes at 68 F, agitating the tray frequently. Visible image will now reappear.

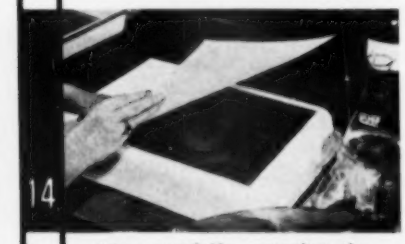
9 Pour off modeling agent and wash the film in two baths of 2% acetic acid to remove excess black dye.

10 To remove matrix from its temporary base, soak film in 110 F, 2% acetic acid bath. Gelatin image is now stripped from film.

11 Prepare final support by soaking a sheet of dye-transfer paper in water. Then cover paper, emulsion side up, with 2% acetic acid.

12 After a two minute flushing of the stripped matrix in hot 2% acetic acid bath, lay it down carefully on paper and float into place.

13 Flexichrome transfer sheet is placed over the matrix to protect image. Now use squeegee to remove all acid so matrix adheres.



14 After carefully removing the transfer sheet, place blotter over the matrix and allow print to dry.

white enlarging, such as burning-in or dodging, can be used when making your exposure. (Naturally, a Flexichrome matrix can also be made from a color transparency if the slide is first copied on panchromatic film.)

Any enlarging trick or technique which can be done in regular black-and-white work can be employed in the Flexichrome process to give startling results. One can make photograms, double or triple exposures, or combinations of negatives—all to be colored in any way the photographer wishes. Of course, for good Flexichrome prints of an experimental nature you need, besides technical ability, a solid understanding of the medium of color. Your (*Continued on page* 132)

BLACK-AND-WHITE NEGATIVE TO FINAL FULL COLOR PRINT

15 Abstract black-and-white photograph has been transferred to Flexichrome film and is ready for colors. Yellow dye applied above.

16 To color Flexichrome: (a) apply color (green dye here); (b) blot excess dye; (c) rinse with 2% acetic acid; (d) then blot again.

17 The last dye applied gradually replaces the previous color so mistakes are not serious in Flexichrome. Author adds blue dye here.

18 With the red dye added, the final picture begins to take shape. If desired, color may be removed by use of Flexichrome reducer.

Completed "Color in Action" by the author demonstrates unequalled freedom of color control in Flexichrome process. Creative possibilities are infinite.

2 NEW FILMS

Ansco introduces two high-speed tungsten color films—in sheets for studio and 35-mm rolls for photofloods and available light

TWO new Ansco color films which have recently appeared broaden the photographer's latitude both in the studio and on location. They are: Anscochrome Tungsten 3200 K sheet film, and 35-mm Anscochrome Tungsten 3400 K roll film.

First, the sheet film allows photographers to use 3200 K tungsten studio lamps without resorting to filters, and provides high ASA ratings. (Although ASA 25 is the recommended rating, you can go as high as ASA 125 with forced processing.) Formerly, photographers were limited to a 3200 K film which was rated at ASA 10.

With this new sheet film (available in sizes from 2¼x3¼ to 11x14) it is possible to shoot action in the studio without electronic flash and with less illumination than before. The high emulsion speed of the film also helps in getting greater depth of field.

Second, the new 35-mm Anscochrome 3400 K film, originally intended solely as a professional motion-picture material balanced for photoflood illumination, now opens the door wide to available-light color photography. (This emulsion will supplement the 35-mm Anscochrome 3800 K film now on the market which can be used with clear, wire-filled flashbulbs.) Tests (*Continued on page* 93)

NEW TUNGSTEN FILM MAKES ACTION-STOPPING POSSIBLE WITHOUT FLASH IN THE STUDIO

Photographer Shelly Grossman made the photograph of dancer Fleur Raup (right) with new Anscochrome 3200 K Tungsten film. He used three studio lamps; a 3000-watt main-light, 2000-watt lamp on the background, and a 1000-watt fill-in. With any other film in his camera, Grossman would have had to use electronic flash or step up the number of lights many times. He rated the film at ASA 125, exposed at 1/295, f/4.5, and force developed.

John Durniak

35-MM ANSCOCHROME 3400 K FILM IS SOLD IN 100-FOOT ROLLS

Originally intended for motion-picture work, new Anscochrome 3400 K film must be loaded into cassettes from bulk. Approximately 20 36-exposure rolls may be obtained from a 100-foot roll.

COLOR PROCESSING WITHOUT A DARKROOM

By NORMAN ROTHSCHILD

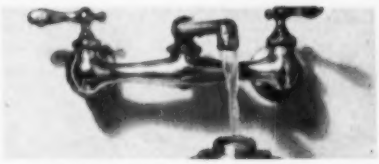
There is a lazy-man's rumor current to the effect that successful color processing is a sticky business requiring a large amount of special equipment and some sort of very special skill. We hear that operations must be carried out with "split-second" accuracy, that elaborate temperature controls must be maintained, that the photographer must combine feats of coordination and finesse worthy of Fred Astaire or a jet pilot.

Color processing does require more care than run-of-the-mill black-and-white work. But it doesn't take much more skill than any darkroom worker would lavish on a roll of 35-mm film that has to be enlarged many diameters. And don't let the spectacular variety of shiny, new color-processing equipment floor you. If you can afford it, it cer-

1 **ANSCOCHROME.** Immerse film for 16 minutes at 68 F in first developer, agitating for 15 seconds of each minute.

1 **EKTACHROME.** Develop in first color solution for 10 minutes at 75 F, agitating continuously for first 15 seconds.

2 **ANSCOCHROME.** Immerse film for one minute in shortstop solution at a temperature of 68 F, agitating continuously.

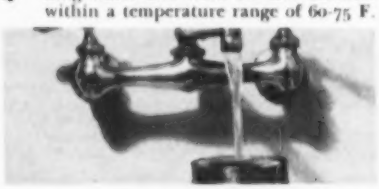


2 **EKTACHROME.** Rinse in running water between 73-77 F for one minute, agitating continuously for first 15 seconds.

3 **ANSCOCHROME.** Immerse in hardener for 4 minutes at 68 F, agitating continuously for 1 minute. Turn room lights on.

3 **EKTACHROME.** From 3 to 10 minutes in hardener at 73-77 F. Agitate for first 15 sec, then for 15 sec of each minute.

4 **ANSCOCHROME.** Place tank under running water and wash for five minutes within a temperature range of 60-75 F.



4 **EKTACHROME.** Turn room lights on. Reversal exposure made through end of reel, 15 sec, 1 ft. from no. 2 flood.

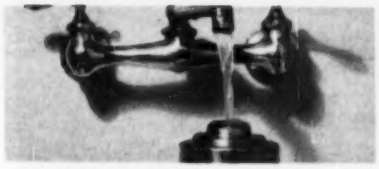
5 **ANSCOCHROME.** Make reversal exposure of 3 minutes (1½ minutes each side) at distance of 3 ft from no. 2 flood.

5 **EKTACHROME.** Place tank under running water and wash film for 3 minutes within a temperature range of 73-77 F.

6 **ANSCOCHROME.** Film is immersed in color developer for 14 minutes at 68 F. Maintain developer temperature exactly.

6 **EKTACHROME.** Film is immersed in color developer solution for 15 minutes within a temperature range of 73-77 F.

7 **ANSCOCHROME.** Pour in stop bath for 1 minute at 68 F, agitating continuously. (Use same solution as in step no. 2.)

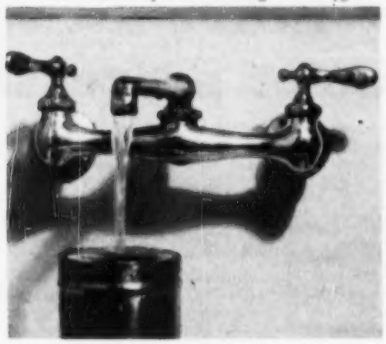


7 **EKTACHROME.** Place tank under running water and wash for five minutes within a temperature range of 73-77 F.

8 **ANSCOCHROME.** Immerse film in hardener solution for 4 minutes at 68 F, agitating continuously during first minute.

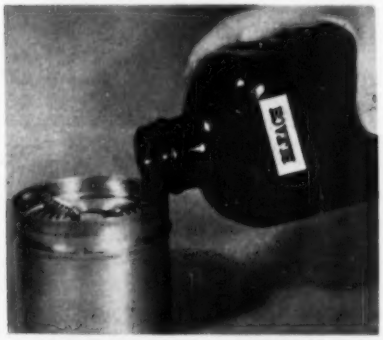
8 **EKTACHROME.** Immerse in clearing and fixing bath for 5 minutes at 73-77 F. (Save solution for use in step no 12.)

9 **ANSCOCHROME.** Place tank under running water and wash film for 5 minutes within a temperature range of 60-75 F.



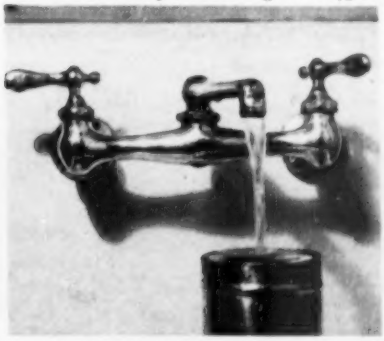
9 **EKTACHROME.** Place tank under running water and wash for not less than 30 seconds or more than 90 sec at 73-77 F.

10 **ANSCOCHROME.** Pour bleach solution into tank, immersing film for five min at 68 F. Increase bleach time after use.



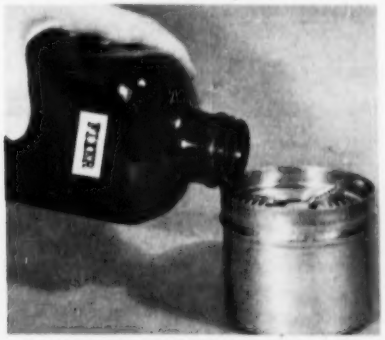
10 **EKTACHROME.** Pour bleach solution into tank and continue immersion for 8 minutes at a temperature of 73-77 F.

11 **ANSCOCHROME.** Place tank under running water and wash film for 3 minutes within a temperature range of 60-75 F.



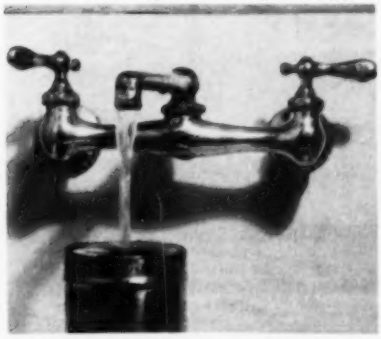
11 **EKTACHROME.** Place tank under running water and rinse film for 1 minute within a temperature range of 73-77 F.

12 **ANSCOCHROME.** Pour fixer solution into tank and continue immersion for four minutes at a temperature of 68 F.



12 **EKTACHROME.** Using solution saved from step no. 8, clear and fix film for three minutes at temperature of 73-77 F.

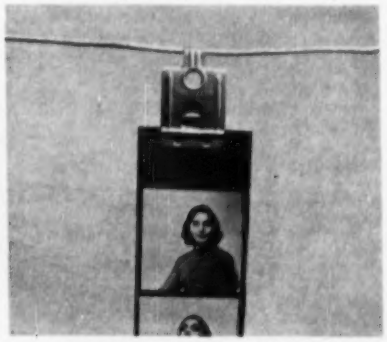
13 **ANSCOCHROME.** Place tank under running water and wash film for ten min within a temperature range of 60-75 F.



13 **EKTACHROME.** Place tank under running water and wash film for 8 minutes within a temperature range of 73-77 F.

14 **EKTACHROME.** For stabilization, use either Kodak Ektachrome Stabilizing Bath for Process E-2 or diluted Kodak Photo-Flo Solution plus ¾ oz Kodak Formaldehyde per gallon. Immerse film in stabilizing bath for one minute at 73-77 F.

14 **ANSCOCHROME.** Wipe gently with a damp chamois or viscose sponge, clip and hang to dry in a dust-free place.



15 **EKTACHROME.** Drying is basically the same as for black-and-white film. But don't allow temperature to pass 110 F.

continued

Beware these errors in color processing

Normally exposed transparency of flowers in a vase looks like this when correctly processed. Duplicated transparencies were deliberately given faulty processing to produce the six unsightly failures reproduced in full color below.

Anscochrome and Ektachrome

Yellow safelight produces over-all yellow cast. Avoid exposing film to any light until after first hardening bath.

If first developer is too hot or development continued too long result looks like overexposure with weak highlights.

Insufficient bleach causes retention of silver and produces a dense transparency with unpleasant over-all greenish cast.

Ektachrome only

Omission of first hypo with Ektachrome produces a transparency with dark, muddy colors, as if severely underexposed.

Insufficient wash after color developer leaves a heavy magenta color. *All* time-temperature directions must be followed.

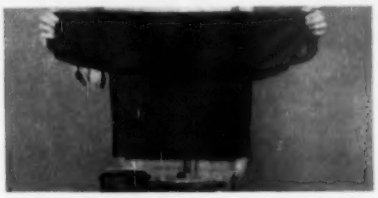
Anscochrome only

Insufficient wash after bleach with Anscochrome may produce loss of cyan dye, resulting in an over-all magenta cast.

See text for complete list of processing errors and what causes them.

2 ways to load your developing tank with color film in daylight

To process Anscochrome without a darkroom you'll need the materials shown above: a changing bag, developing tank, Anscochrome Processing Kit, six bottles for the processing solutions, a thermometer, and a graduate. Changing-bag technique is illustrated step by step below.



Place tank, reel, and film in changing bag.

Memorize position of items placed in bag.

Zip both inner and outer layers of bag shut.

Place hands in sleeves, load reel and tank.

tainly is nice to own. But this article should convince you that you can make your own color transparencies at home with little more than your present equipment—and you don't even need a darkroom!

In the step-by-step pictorial illustrations you will be briefed on the technique of processing both Ektachrome and Anscochrome film, shown good and bad results, and taught to load your tanks in daylight. In the following text, we'll attempt to give you some enlightening comments on the broad, general problems you may encounter.

The biggest reservation expressed about home color processing is the idea that accurate solution temperatures must be maintained precisely. This is actually not so serious a problem as we have been led to believe. For instance, in processing Ektachrome only the first developer must be maintained at 75 F plus or minus ½ F. All other solutions and rinses may be used within a temperature range of 73-77 F, thus leaving you plenty of margin for error. Ansco does recommend use of all solutions at 68 F although wash water may be used within a temperature range of 60-75 F. Even here there is more leeway than the manufacturer's instructions might lead you to believe. You can get good results in Ansco developing if you maintain the first and color developers at 68 F plus or minus ½ F and use the other solutions within a temperature range of 65-70 F.

As for maintaining temperatures in your solutions, the easiest way is to use a water bath like the one shown on page 118. In hot weather place ice in the water bath but not in the solutions. (If you must bring solution temperatures down quickly buy plastic "ice cubes" at your (*Continued on page* 117)

Kodak's Ektachrome Processing Outfit for 35-mm includes a daylight-loading tank, thermometer, six varicolored 16-oz containers, 16-oz graduate, stirring paddle, 2 plastic film clips, 100 slide mounts, film-cutting guide, 4 slide boxes. Details of tank loading below.

Thread end of film onto reel in room light.

Lock tank cover and complete loading of reel.

After loading, turn small knob, sealing tank.

Remove empty cartridge, pour in solutions.

Well-organized scenic pictures like this bright autumn landscape by the author rank first in popularity with calendar publishers.

"Frankie" by Paul F. Paulsen, Santa Barbara, Calif., is an ideal calendar picture depicting a happy and healthy child having fun.

"Study" by Joe E. Kennedy, Tulsa, Okla., meets the standards of the calendar market for nudes.

→

Human interest is what makes this charming shot by the author salable calendar material.

CALENDARS

need your color

Here's first-hand advice on how to crack a ready, high-paying market for transparencies

By WENDELL MERRILL

THERE are few better ways to turn pictures into income than by selling color transparencies to calendar publishers. Most amateur photographers know nothing at all about this big and lucrative market. Although the number of top-paying publishers who buy free-lance color transparencies is relatively small (for a representative list, see page 91) it represents a very attractive market because thousands of transparencies are bought every year and the prices are encouragingly high.

Prices vary, depending upon the subject matter of the transparency, the needs of the particular buyer, and the use to which the picture will be put. A picture used on a calendar which sells millions of copies will, of course, bring more money than one used in a more limited way. The minimum payment is usually about $100. Average prices paid are considerably more. An occasional outstanding transparency that happens to reach the right buyer at the right time may well bring $300, $400, or even $500. If you can demonstrate your ability to make the type of pictures the calendar buyers want, you should be able to count on an average selling price of $150 to $200 each.

Now, of course, there's no use pretending that calendar publishers are sitting around with fat check books and fountain pens ready, just waiting to buy the first transparency that comes along. The calendar publisher is like any other picture buyer. He is willing and able to pay exceeding- (*Continued on page* 88)

Exciting sports shots rank second in sales. Dennis Hallinan stopped action in Florida surf.

Appealing photographs of dogs also sell well. This one, by the author, is a typical example.

OVEREXPOSURE

UNDEREXPOSURE

IMPROPER LOADING

IMPROPER LIGHTING BALANCE

LIGHT TOO RED

LIGHT TOO BLUE

IMPROPER STORAGE

FLARE

LIGHT LEAK

WHAT'S WRONG WITH MY COLOR?

← Do your pictures show these faults?

A VISIT TO A PROCESSING LAB REVEALS THE MOST COMMON ERRORS MADE BY PHOTOGRAPHERS

By ROBERT L. McINTYRE

EVERYBODY who shoots color gets good pictures—sometimes!

The trouble is, we aren't consistent enough. Opening a box of slides, fresh from processing, is a bit like Christmas. We have to look at them to know for sure what we've got.

Next time you get back a set of slides, sort them out according to quality as you run through them for the first time. If you have average luck and skill they will end up in three piles. The one at the left will contain a few sparkling transparencies you'd be proud to show anywhere. In the middle will be the bulk of the roll—good, run-of-the-mine shots that may vary a little in quality and still be perfectly satisfactory. Then, at the right and nearest the wastebasket, will be a few slides you'll have to admit are just about a total loss.

This is the color fan's usual lot. It varies on the rare days when everything goes just right and he gets a perfect roll. Then there are the sad days when calamity seems to strike. It can affect a few shots or reduce a whole roll of film to washed-out red or dismal mottled green.

How do I know? I've been looking over the shoulders of thousands of color photographers with the aid of the editors of POPULAR PHOTOGRAPHY. No, we haven't been stalking them with binoculars like bird-watchers or hiding beneath rocks at popular scenic spots. We've been haunting the color laboratories, seeing pictures sent there for processing by fans all over the country. We've looked at miles of Kodachrome and Anscо Color, plus a sampling of new Ektachrome. If you've had a roll of color film developed in the past few months, there's a chance that we have seen it. Maybe you helped write this article—especially if every shot didn't come out exactly right.

Most of our looking was done at the Eastman Kodak Company laboratory in Chicago, where the post office delivers truckloads of 35-mm and No. 828 Kodachrome for processing these busy summer days. The rolls of film are spliced together for handling on big reels. Each reel is inspected after the film has been processed and before it is cut and mounted. The darkened inspection room is an ideal place to look at pictures, mass-production fashion. Over a thousand shots per hour move across each inspector's screen. Here are some of the things we found.

Aging and storage

We are likely to think of mistakes in camera handling as the biggest cause of picture failure. One of the revelations of this first-hand study was that amateurs probably lose more photos through defects associated with film aging than for any other single reason. They don't pop up as often as some defects, but when they do occur they often affect the whole roll.

An over-all greenish cast, sometimes mottled, is the symptom of this ailment. It is most noticeable, often, near the edges of the film. It is caused by using color film that has run past its expiration date or, more often, by allowing it to become exposed to excessive heat or humidity. (*Continued on page* 124)

Color in the

NIGHT

Traditional fireworks display in Japan was photographed by Yoshikatsu Nakayama with Contax IIa on Kodachrome Type A film at 15 sec, f/3.5. Tripod was used.

If your camera is still loaded with color film after a day's shooting in the great outdoors, don't pack it away just because the sun has set. With either daylight- or tungsten-type color film you can capture dramatic panoramas of street and automobile lights, the cool mystery of moon and starlight, and the explosive beauty of carnival fireworks.

For many night pictures the best time to shoot is shortly after dusk, when there is enough reflected light left in the sky to let you see the separation between buildings, trees, and sky. Since your exposures generally will be quite long, a tripod or secure support is essential. In photographing fireworks, however, it is possible to get some unusual effects by moving the camera in a regular pattern while the shutter is open.

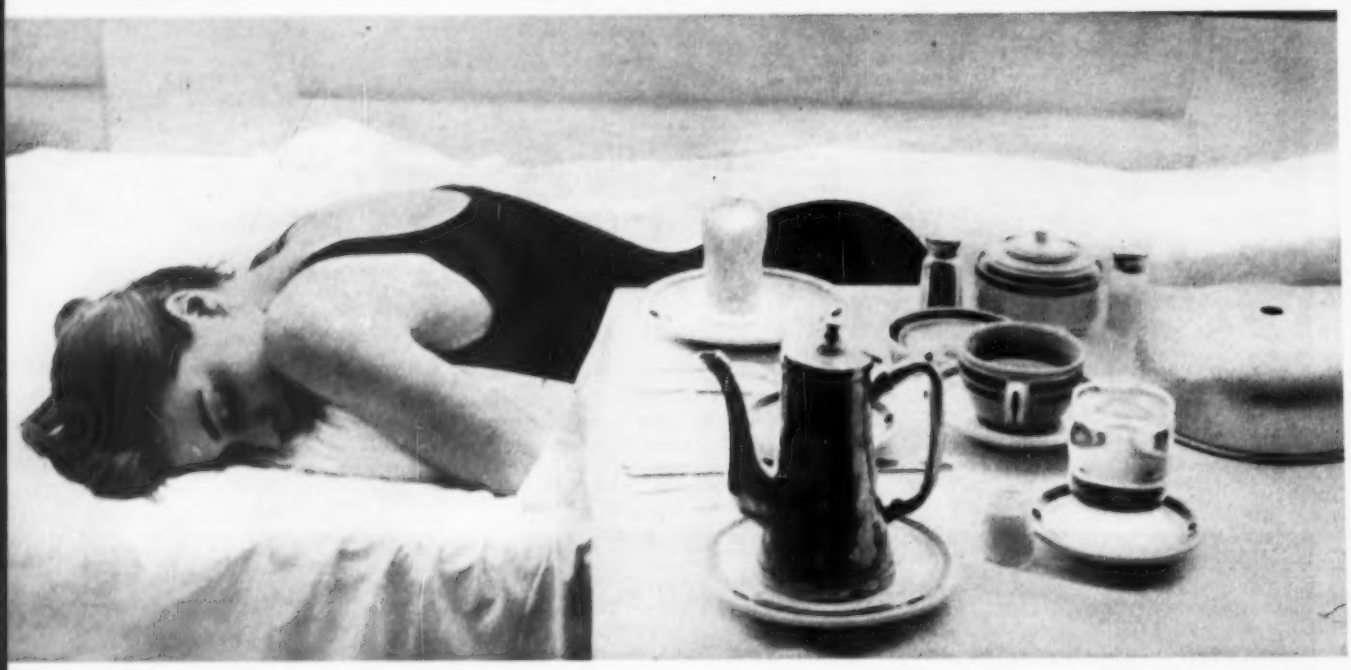
If your main interest in color photography at night is to convey a heightened impression of the scene rather than to worry about accurate color rendition, you may find the additional warmth of daylight film more satisfying than tungsten-corrected types. In any case, because of the deceptiveness of color values at night, you will soon discover that this is a field in which the spirit of adventure is more important than the goal of precision.—

"Moonlit" scene by Arthur Y. Neill consists of double exposure of statue made in sunlight with 50-mm lens at 1/150 sec, f/16, and moon photographed with 385-mm lens, 1 sec at f/16. Exposures were made with Exakta on Daylight Kodachrome.

Just after sunset, John Ross shot this bridge over the Nile with a Leica IIIc, 1/25 sec at f/2 on Daylight Kodachrome.

Cool beauty of a Persian Gulf refinery at night was caught by M. Z. Haque with Rollei at 5 sec, f/16, on Daylight Ektachrome.

BERT STERN'S APPROACH



TO GLAMOR *An art director-photographer emphasizes mood and achieves sophisticated simplicity in his pictures of women*

A morning in Cuba, a sleeping girl, and a bedside breakfast are combined to make an evocative illustration for a travel story, above. Test shot of a model, right, taken in Stern's daylight studio, is a typically direct, intense portrait against a stark background.

By ARTHUR GOLDSMITH

Probably no type of photography is more tediously cliché-ridden than the so-called "glamor" picture, an omnibus term used to cover almost anything from high fashion to cheesecake. But despite the trite formulas and stock situations it is still possible to find a fresh, interesting approach to photographing beautiful women. Twenty-six-year-old Bert Stern, one of the rising new talents in advertising photography and a former art director, has worked out such an approach for himself with results that are as highly personal as they are visually exciting.

His glamor pictures, which include travel and fashion illustrations, portraits, test shots, and pictures made just for fun, have the stamp of a unique style. Ignoring the conventional canons of "good"

A narrow beam of window light models lovely face of Hildegarde Neff. Stern moved close with Hasselblad to get dramatic, intimate close-up.

→

Dying daylight at the beach softly illuminates girl's face. Taken at end of formal shooting session with a Hasselblad, Anscochrome Daylight.

photography, Stern freely exploits soft-focus effects, motion blur, grain, flare, overexposure, and black, unfilled shadows to heighten emotional content. His photographs of women, both in color and black-and-white, are marked by intensity of mood and strength of design. He prefers to work at intimately close distances with a small hand-held camera, shooting by subdued natural light and composing his subject as a simple form against a stark background.

What he gets may strike some as annoyingly off-beat or even downright sloppy, but the best of his efforts are "stoppers" that lend themselves admirably to graphic design and the demands of magazine layout.

The pictures reproduced here are by-products of Stern's regular work, which includes fashion and travel illustrations for magazines as well as advertising assignments—his mainstay. Although some are happy accidents casually hit upon while using up the end of a roll of color film after a formal shooting session,

Long-haired girl posed for series on "the natural look" in beauty. Final print was an enlargement from a small part of Rollei negative.

Backlighting from studio floods add a delicate, airy touch to this graceful profile.

Sleep is vividly suggested by this blurred-focus natural-light picture. Stern used a Rolleiflex here.

many were shot to fit preconceived layouts. Stern believes "the photographer's responsibility doesn't end when he turns the picture over to the art department." While some art directors and editors may disagree with this statement, in his own case, at least, it seems justified. For more than two years he was not only chief photographer but also art director for *Fashion & Travel* magazine. Thus, many of his glamor pictures are strictly functional: he set out to do a specific job, create a desired mood, suggest a preconceived idea.

For example, his sleeping girl with her bedside breakfast was shot with a double purpose: to show fashions (in this case the model's swim suit) and at the same time evoke the pleasant emotions associated with travel to romantic, beautiful places. The picture suggests a girl resting in the sun after an early morning swim and the luxury of breakfast in bed. As Stern puts it: "Photography can create a new world of its own—a world we'd like to live in."

However, not all his pictures of women are pleasant daydreams for the escapist. He also has a knack for making direct and intimate portraits which have almost the impact of meeting a real person face to face. The color shot of Gwen Verdon, for example, is a powerful portrait which reveals an unexpected facet of her personality. "We've all seen her in motion so much I thought a very static picture might be interesting," says Stern. He was able to catch an underlying seriousness which is augmented by the somber, low-key lighting.

Although he does use an 8x10 studio camera for some specialized assignments such as still lifes, he prefers small, hand-held cameras for their mobility and ease of shooting, especially when the subject is a person. All the pictures reproduced here were taken with a Rolleiflex with an f/3.5 Tessar lens or a Hasselblad with an 80-mm Ektar, his two most-used pieces of equipment. He likes the convenience of a groundglass reflex viewing system and finds the 2¼x2¼ square format of these two roll-film cameras no handicap. In fact, he often exploits the square format to the full by composing right up to the edges of (*Continued on page* 94)

Eartha Kitt, photographed dancing in Stern's studio, becomes a semi-abstract form against a bare background.

Gwen Verdon is seen as a serious, thoughtful woman in this low-key portrait. Studio daylight, Anscochrome.

→

PRINT ■ CLINIC

WHAT'S WRONG WITH MY PICTURE?

A department of print criticism for amateurs by the editors of POPULAR PHOTOGRAPHY

←

Fabio Doria, São Paulo, Brazil. Landscapes are provocative, and stir up much controversy. The same picture can be called "pleasingly quiet" by one critic and "empty and uninteresting" by another. This one seems to lack a focus for the attention. Probably it would have been better to move closer to the edge of the hill, including more of the town hidden behind it. As it is, the picture would be improved by cropping at both right and left. A filter to darken the sky would also have helped, even if there were no clouds visible.

Canon, Gevapan, 1/60 second, f/8

↓

Peter R. Doran, Ridgewood, N. J. This situation had great promise for a bright, warm picture of a pretty girl. But a lot of the appeal has been lost because bright sun has quite naturally made the girl squint. It would not have been difficult to move her into the shade of the tree in the background, or turn her away from the sun, so that the light would be more flattering. The brilliance of the sun has also made most of the highlights lose detail. The nearness of the camera has caused some distortion of the leg in the foreground.

Rolleiflex, Plus-X, 1/100, f/5.6

←

Joseph E. Hill, Allentown, Pa. Here is an interesting attempt at indoor portraiture, made with two No. 2 floodlamps. However, shooting at f/4 and focusing on the lady's face, Mr. Hill has lost sharpness in the hands, which are almost equally important. If he were unable to use a smaller aperture, he might have placed the hands closer to the body, so they would be in nearly the same plane as the face. And a little more care in lighting could have avoided most of the distracting shadows of spectacles on the face.

Rolleicord, Plus-X, 1/25, f/4

←

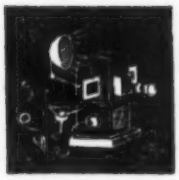
Carol Lade, Cleveland, Ohio. This is a charming, spontaneous shot of two children reading, in which the book serves to reflect sunlight into the faces. A moment might have been chosen when they were looking at the top of a page, so more of their faces would be visible. And the book, by being the closest part of the subject, assumes a little too much importance. Moving back a foot or two would have helped.

Rolleiflex, Plus-X, 1/100 second, f/8

PICTURES SUBMITTED FOR PRINT CLINIC WILL NOT BE RETURNED

HOW TO CHOOSE A SLIDE PROJECTOR

By ROBERT L. McINTYRE



PART 1— NEW TRENDS IN PROJECTION

Taking crisp, brilliant pictures is only half the fun of color-slide photography. Sharing them with friends and relatives is satisfying too, but you need a good projector to show your pictures at their best. Today, good slide projectors are not hard to find. The photo dealers' shelves are loaded with fine equipment, better than ever before. There are over 100 projectors on the market that will take the popular 2x2 slides, and practically every one of them is a good buy. Such a wealth of equipment almost makes the choice difficult instead of simple. The problem is to find, among many units that do a good job, the one that will be best for showing your pictures as you want to present them. It won't necessarily be the most elaborate and expensive outfit, even if cost is unimportant to you. There have been many improvements in slide projectors during the past few years. This article is planned to help you see how your own projector measures up to today's equipment and to point out the things to look for if you are thinking of buying a new one.

basic design improvements

There are no "secrets" in slide-projector design. Every new model is thoroughly tested—not only by its own manufacturer, but also by most of his competitors. When one firm scores a gain, everybody soon knows how it was done. The major problem in building a slide projector is to deliver on the screen as bright and sharp a picture as you can, with a minimum of heat at the projector. It begins with the lamp and includes the projector's optical and cooling systems.

Lamp manufacturers are constantly working to improve their products, sometimes with the cooperation of the projector designers and always with an understanding of their needs. Lamps have gained in brightness and the shape and position of their filaments have been modified to make them work more efficiently in a projection system. The size and burning position of its lamp is an important factor in determining the over-all dimensions and general appearance of a slide projector. The recent trend is toward smaller glass enclosures for lamps of a given wattage. Design changes make it possible to burn them efficiently in a horizontal position, instead of mounting them base down in the traditional way. These developments are reflected in projectors with a new look, lower in height and broader of base. Whatever their nature, everyone shares alike in lamp improvements.

A flow of air through the projector is what keeps it cool, and simpler, cleanly designed units provide more light with less heat than their predecessors. Projector optics are simple and are made to funnel as much of the lamp's light as possible through the transparency and onto the screen. New combinations of lens elements and heat filters do the job better, and these things can't be kept secret or covered by patents. As a result, there have been steady gains by all the leading makes of projectors.

projector automation

With lamps and optical and cooling systems pretty much on a par, or separated by differences unlikely to last long, how can you choose between projectors? An important factor to consider is the slide-handling system. It has undergone a resolution which is still underway.

Not so many years ago, slide carriers were all alike. They contained left and right slide pockets which were loaded by hand and shuttled back and forth to present the show. That old, reliable system still is used in basic, economy outfits but there is a steady increase in the number of projectors equipped with shutters and with carriers that provide semiautomatic and automatic slide changing. They are built to fit in with filing systems so you can take a whole drawer full of slides and run them through the projector at once. You may have to pull a lever to change pictures, if your unit is only semiautomatic, or you can just sit back and push a button or let your projector run itself if you have a completely automatic outfit. Either way, you don't have to touch a slide.

Individual preference is what counts in choosing a slide-changing system. If you like to put on smooth, professional showings with slides carefully arranged beforehand, an automatic changer is ideal. If you show pictures very informally, and like to skip around and select different pictures in a new order to fit each audience, you may find that the automatic equipment would cramp your style. If you want to look at each slide before you show it, the manual system still is best.

The timing cycle of completely automatic projection remains the same, once it is set, to throw slides on the screen at intervals measured with deadly accuracy. This seldom is desirable for an amateur show—you need change of pace to show each picture for the time it deserves in relation to the rest of the program. A recent development in projector design permits a combination of automatic and push-button-actuated changing. This makes it possible to set the projector for a basic interval and then to shorten the showing time of individual slides at will as the show moves along. Automatic projection is so new it is likely to receive a great deal of emphasis in designing programs within the next few years.

Any changing system that is power driven opens the way for control by an electrical impulse from a push button or from a tape recorder. This makes possible a slide-sound program in a package, with the tape automatically providing cues to make the slides change at the right time, all by themselves. Automatic changing systems and the best ways to use them will be discussed in more detail farther along.

PART 2— PROJECTORS FOR THE PARLOR

Most amateurs buy projectors to show their own slides at home. Practically all of today's 300-watt outfits produce plenty of light to cover the 30x30 and 40x40 screens that are most popular for home use. Smaller units in the 100-, 150-, and 200-watt sizes are less expensive but require sacrificing either screen size or brightness. A few years ago it was impossible to talk about brightness in terms of wattage. There were such wide variations in projector efficiency that a given 200-watt outfit might outperform another machine using a 300-watt lamp. There is much less difference between today's projectors. The worst of a series of the same size, equipped with a new lamp, may produce just as much light as the best one with a lamp that is near the end of its rated life.

Initial economy is the main reason for purchasing a projector below the 300-watt size. If you don't require a large screen, the economy makes sense. Some of the smaller units in the 100- and 200-watt sizes are designed to provide adequate cooling by convection, without a blower. This is a distinct advantage if the whir of a fan bothers you. No matter how smoothly fans and other air-moving devices may spin on their bearings, they have to beat the air in order to move it and a certain amount of noise is inevitable. Convection-cooled outfits are popular in the few areas not served by 110-volt, 60-cycle a-c, for fan motors are designed for operation only with that type of current. You can change lamps to adapt a projector for any voltage of a-c or d-c, if you don't have to worry about a fan built for 60-cyle a-c.

selecting a screen

The projector alone doesn't determine the brightness and sharpness of the image that you see. The screen you select is almost as important.

There are three types of screen surfaces in general use today—matte-white, crystal-beaded, and silver. Each has characteristics that make it most suitable for particular types of service.

Matte screens are the least brilliant, but are suitable for viewing from a relatively wide angle. If the best seating arrangement in your home places the audience across a wide area so the screen must be viewed from the sides as well as the front, this type of screen may be just what you need. It usually is less expensive than other types.

Crystal-beaded screens give a more brilliant image than those with a matte surface. They are made by covering a white screen fabric with tiny beads of glass. For many years the beaded screen was the favorite of most slide makers. It is not suitable for use under conditions where it must be viewed from very close positions—six feet or less. At short distances like this, the texture of the beaded surface is readily apparent and robs the image of the sharpness it otherwise would have. The surface simply isn't smooth enough to resolve image detail that is in the slide and that can be projected on the screen. When viewed from farther back, however, the texture isn't noticeable.

Silver screens were used when motion pictures first came out, and were popular during the early years of slide projection. Then they were replaced quite generally by the matte and beaded types.

During the past few years, driven by the need for metallic surfaces to show 3-D pictures and maintain the polarization of left- and right-eye views, manufacturers have made great improvements in silver screens. They are capable of producing more brilliant images than either matte or beaded surfaces. Although it was stereo that sparked their revival, the improved silver screens are finding favor for all sorts of projection. They are somewhat more directional than other types, requiring that the audience be seated more directly in front of them, but their fine surface texture brings out maximum detail.

Thus the screen is an important part of the projection setup. A projector of lower wattage can be teamed up with a highly reflective screen where more brilliance is required. If the seating arrangement requires a wide angle of view, a more powerful projector can be used with a matte screen which lacks brightness but can be seen better from the sides.

Method of support also is important in choosing a screen for convenient use. A simple roller screen is fine for the living room if you have a place to hang it on the wall and always use it in the same place. Tripod units are more adaptable for use in different locations. The new silver screens, which must be kept taut to get a perfectly flat reflecting surface, are designed so the screen material can be drawn tight after setting up.

home voltage requirements

The brightness and color quality of the pictures you get, once you have selected a projector and screen, depend on the projection lamp and the amount of electrical current that is delivered to it. The lamp itself slowly loses efficiency.

Lamps in the 300-watt and smaller sizes are designed for use on 110-volt current and have a rated life of 25 hours. If the line voltage drops, they burn less brightly and their light takes on a yellowish cast. In most areas the current delivered to the home holds fairly constant. Sharp reductions in the voltage often occur, however, when an electrical circuit is overloaded with appliances that require more current.

For best performance, check the circuits available in your home and select for your projector one that is not heavily loaded with other electrical equipment. It may require a slightly longer extension cord to reach it, but a line that is not shared by a deep-freeze unit, furnace blower, air conditioner, or other heavy appliance will give you better and more consistent illumination.

With projector and screen suited to your requirements and enough electrical current to operate the unit efficiently, you have the basic essentials for putting on a good show. Smaller differences to look for, if you'd like to take the time to squeeze every last possible bit of quality into your showings, are discussed on the pages that follow.

PART 3— THE PICTURE ON THE SCREEN

You look at light when you see a slide projected. The amount of light determines screen brightness. Its quality is reflected in the colors of the image. The way it is distributed controls screen coverage. How well it is brought into focus determines the sharpness of the picture. These four factors—brightness, color, coverage, and sharpness—are the things to look for in a projector. They govern the quality of the picture as it appears on the screen.

judging screen brightness

There are two ways of evaluating screen brightness, by eye or with an exposure meter. Neither one tells the whole story alone, but your eye is likely to be the best judge. It is sensitive to color differences as well as brightness variations, and the two are equally important.

The best way to compare a pair of slide projectors is to set them up, side by side, with empty 35-mm slide masks placed in them to project vertical apertures side by side on the same screen. Chances are that the two lenses won't be exactly the same, so you will have to shift one projector forward or back to make the images of the two masks appear just the same size.

Both projectors should have new lamps or lamps of the same age. You can cancel out the effect of the lamps, if they are of the same size, by interchanging them and observing the effect. In a side-by-side comparison like this it is quite easy to judge which aperture is the brightest. An exposure-meter reading, using either incident or reflected light technique, will help you determine how great the difference is. To make comparisons you don't have to do a lot of figuring to convert your findings into any particular type of units. The figures on the dial of your meter will be ac-

curate enough, regardless of the system in which it is calibrated. If you're interested in some sort of numerical standard, the figure established for brightness at the center of a 35-mm movie screen is 10 foot-lamberts with a tolerance of plus-four or minus-one. This brightness level was adopted by the American Standards Association in 1944.

projection color quality

Practically all amateur slides are color transparencies, and their hues depend in part on the projector. Color films are balanced to produce as accurate color rendition as possible when illuminated by tungsten light. Lamps that are new or used for only a relatively small portion of their life provide light of the ideal color when they are burned on electrical current of their rated voltage. Fortunately, we are willing to accept considerable color variation on the screen. No film is perfect, to begin with, and errors are added by the camera lens, the exposure, processing, and projection. Most fans who delve deeply into the problems of color photography are happy to achieve a result that is pleasing in itself without worrying too much about whether the hues match those of the original subject matter. This makes sense. Objects of the same color appear quite different under varying conditions of lighting as we see them in everyday life. We have learned to accept them that way. From a practical point of view, the best we can hope for in a projector is that it provide illumination that will not distort the colors of our pictures in any one direction.

Condensers, heat filters, and lenses are the parts of the projector's optical system which affect the color of the picture on the screen. If there is a significant difference between the beams of light thrown by two projectors, usually it can be traced to the number and kind of heat filters that are employed. They appear blue-green to the eye and impart a bluish cast to the screen image. Unless the effect is very pronounced, you can't detect it unless you have two projectors side by side and compare their light beams.

If a noticeable error exists, pictures will be more pleasing when the light leans toward the yellow-red tones rather than the blue. People seem to like warmer hues than today's color materials give us, or at least are more ready to accept errors on the warm side rather than the cold. When a projector is as near perfect as it can be at the time the lamp is new, it slowly shifts in the direction of the warmer, yellow-red tones which are most pleasing. A unit that makes pictures seem slightly cold and blue with a fresh lamp may come into its own along about the time when the lamp can be expected to burn out.

Line-voltage variations affect colors, too. High voltage makes the light lean toward the blue. Low voltage makes it more yellow-red. Lamps in the larger sizes can be purchased in three ratings—100, 110, and 120 volts. When the line voltage is consistently low, a 100-volt lamp will give normal results and the rated number of hours service. When it is high, a 120-volt lamp will perform the same way. If a projector provides illumination rather more reddish than you like when used on 110 volts with a 110-volt lamp, you can get a brighter picture that contains less red by shifting to a 100-volt lamp. You don't get the extra light free, though. More heat is created and lamp life is shortened when a bulb is used on a voltage higher than its rating. If a projector seems to give light that is excessively blue, it can be warmed noticeably by shifting to a lamp of higher voltage rating. This time you gain all around. The color is improved, heat is diminished slightly, and lamp life is prolonged.

screen coverage

At first thought, the ideal light distribution for a slide projector might be considered as perfectly even with exactly as bright an image at every part of the screen. This probably is the best distribution for showing stereo pictures, where you want to create the illusion of looking through a window at a real-life scene beyond it. For regular 2 x 2 slides though, and particularly for pictorial color slides of the type you see in the exhibitions, some fall-off of illumination at the corners seems desirable.

WHAT'S THE RIGHT SCREEN SIZE?

The type of projector, its lens' focal length, and projection distance determine the correct screen size. The charts below will serve as a guide in helping you select the size you will require for use with either one of the two most popular projector sizes, 2x2 and 2¼x2¼.*

2 x 2 PROJECTOR

Lens Focal Length (Projection Distance)	square screen size												
	30"	40"	50"	60"	70"	84"	8'	9'	10'	12'	14'	16'	18'
3"	6'	7'	9'	11'	13'	16'	18'	20'	22'	27'	31'	36'	40'
4"	7'	10'	12'	15'	17'	21'	24'	27'	30'	36'	42'	48'	54'
5"	9'	12'	16'	19'	22'	26'	30'	34'	37'	45'	52'	60'	67'
6"	11'	15'	19'	22'	26'	31'	36'	40'	45'	54'	63'	72'	80'
7"	13'	17'	22'	26'	30'	37'	42'	47'	52'	63'	73'	84'	94'
8"	15'	20'	25'	30'	35'	42'	48'	54'	60'	72'	84'	95'	107'

2¼ x 2¼ PROJECTOR

Lens Focal Length (Projection Distance)	square screen size												
	30"	40"	50"	60"	70"	84"	8'	9'	10'	12'	14'	16'	18'
5"	6'	8'	10'	12'	14'	16'	19'	21'	23'	28'	33'	37'	42'
6"	7'	9'	12'	14'	16'	19'	22'	25'	28'	33'	39'	44'	50'
7"	8'	11'	14'	16'	19'	23'	26'	29'	33'	39'	46'	52'	59'
9"	11'	14'	17'	21'	24'	29'	33'	38'	42'	50'	58'	66'	75'

**Charts courtesy of Radiant Mfg. Corp.*

When the corners are darker than the center of the picture, you get the same effect that salon-print exhibitors deliberately create by darkening the corners of their pictures. It can be argued that this helps to concentrate viewer interest within the picture itself. Regardless of the artistic questions involved, it's a hard, practical fact that few projectors give uniform brightness. When it is approached, it must be achieved by spreading the light over a wider area and diminishing its intensity at the center of the screen.

Image sharpness

These days you see few "achromats" offered as projector lenses. Most units employ "anastigmats" which are corrected for astigmatism and several other aberrations as well as for proper focusing of light of different colors. This improvement has lessened the differences in sharpness that were common in the early days of 2 x 2 slide projection.

Nevertheless, there are significant differences in the sharpness obtained with lenses of different makes and even between specific units of the same make. Sharpness is easy to judge by comparison and should be checked in case of question. Lens coating contributes to the appearance of sharpness by lessening internal reflections. It increases the contrast between light and dark portions of the picture, making detail stand out. Some manufacturers coat all the projector optics, increasing light transmission and the effect of sharpness.

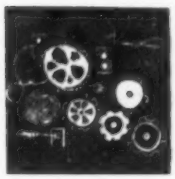
brightness vs. sharpness

Wide-aperture lenses transmit more light for projection, just as they do in taking pictures. They are governed by the same laws of optics that affect camera lenses, so you have to consider sharpness along with brightness in determining their usefulness for you. Here again, the designers usually compromise and an aperture of $f/3.5$ is most common in home-projector lenses.

Maximum-aperture lenses are particularly useful for large-screen showings, where a big image is required for a large audience. They can be employed advantageously when slides are well mounted between glass and when there is a high projector stand available so that the machine need not be tilted upward too sharply to cover the screen. The depth of focus of a lens becomes more shallow as its aperture widens, so you find it necessary to refocus often when using a wide-aperture lens to show slides in cardboard mounts or in an assortment of mounts of other types that are of varying thicknesses. If you place the projector on a low stand and tilt it sharply upward to cover a large screen, you may find that the wide-aperture lens lacks sufficient depth to render both the top and bottom of the picture sharp at the same time. Unless you can raise the projector or tilt the screen forward to reduce the angle of projection, you may have to focus on the center of the picture and let top and bottom go slightly fuzzy.

Lenses of extremely great focal length present problems similar to those associated with wide apertures. They are desirable for showings in large auditoriums where most efficient use can be made of the space by placing the projector at the rear of the hall. Their use necessitates uniform glass mounting of slides to avoid constant focusing, but the longer the throw the less difficulty there is likely to be in attaining sharpness at top and bottom of the screen.

Five-inch lenses are the most popular standard equipment for 2x2 projectors designed for home use. Four-inch lenses run them a close second and are preferred for use in cramped quarters because they provide a bigger image on the screen at short projection distances. In projecting 35-mm slides, a 4-inch lens will cover a 40-inch screen at 10½ feet while a 5-inch lens requires a throw of 13 feet to do the same thing. The next-longest lens in common use, with 7½-inch focal length, covers a 40-inch screen at 20 feet.



PART 4— PROJECTOR CONTROLS

Now that differences in slide-projector performance are less extreme than they were in former years, smaller features are assuming more importance. Among them are the projector controls—the switches, focusing and tilting mechanisms, and the slide-handling systems. Once screen size and brightness requirements have been met, final selection of a projector is likely to be determined by individual preference in this field.

electrical controls

Every slide projector has an off-on switch, either built into the unit itself or set into the line cord that brings electrical current to it. In simple, convection-cooled units this switch just turns the lamp on and off. Medium-sized projectors with power cooling, up to 500 watts or more, have both lamp and fan wired together and controlled by the same two-position switch. The largest outfits some-

times employ three-position switches—off, fan-on, and fan-and-lamp-on. The three-position switch is advantageous in some projector designs, but it may not be necessary or even desirable in other machines of the same wattage.

The purpose of the three-position switch is to facilitate cooling. You can turn on the blower first, and let it get up speed before switching on the lamp. It never hurts to get the fan going early, although it is possible to design fans that gain momentum as the lamp heats so there never is a period when cooling is inadequate. The manufacturer's instruction booklet should be your guide.

Once the projector is in full operation, the switch has no significance until you are ready to turn it off. Then, with some projectors, it is desirable to turn to the fan-on position, which turns off the lamp but lets the fan continue to cool the lamp and the whole projector housing. For a few seconds, this additional cooling may be of value in prolonging lamp life. The lamp itself and the housing parts near it are very hot at the instant the lamp is turned off. If the air current stops at once, in some designs, the temperature in the lamp house may continue to rise for a brief interval. In this case, continuing fan operation will serve to hold down the heat. Regardless of this factor, it is convenient to use the fan to cool the projector when you are in a hurry to pack it away in its case.

Yet fast cooling isn't always good. Maybe you've noticed that lamps most often burn out just as you turn them on, or fail to light at all when you turn on the switch. The failure may date back to the last time the projector was used. When the filaments cool, they contract and tighten. It is possible that fast cooling may place more strain on them than slow, leading to earlier failure. Hence it is best to follow the manufacturer's recommendations on fan-cooling your projector after use.

focusing systems

The best focusing systems, and the most expensive, move the projector lens straight forward or backward without rotating it. They are important in stereo projection, where it is essential to keep two images in alignment on the screen while focus is adjusted, but their extreme precision is far from necessary in amateur slide showing. Next most desirable is helical focusing, which requires turning the lens in its screw mount to shift it in or out. Least precise is simple push-pull focusing with a lens mount that slides into an opening in the projector head and is held by fixed tension in any position where you set it.

Even in push-pull focusing, however, it is possible to keep the lens in proper alignment with the axis of the projector. If you are selecting a budget-priced projector, don't shy away from a unit with push-pull focusing. It's a good place to economize. Learning a smooth focusing technique will help to minimize the distraction caused by this adjustment during your slide shows. If you are observant you can tell which way to shift the lens when you change from a glass-mounted slide to a cardboard one. When in doubt, change the adjustment slightly and note the result. It is annoying to the observer to see the image become blurred as the adjustment is turned the wrong way before a focus error finally is corrected.

Careful, uniform mounting will minimize the need for focusing adjustments during a show. If you choose a system and then stick with it, your presentations will run more smoothly than they possibly can if you have to work with slides in different mounts of varied thicknesses. Glass mounting always is preferable to projecting slides in the cardboard mounts in which they come back from processing. It provides protection for the transparencies while they are being handled, avoiding fingerprints, dust, and scratches, and it holds the film flat in a single plane during projection.

Transparencies in cardboard mounts are not perfectly flat. They curve one way or the other so the center of the film is not at exactly the same distance from the lens as its edges. When you focus the center sharply, the edges appear a little bit soft. This isn't so bad, in itself, if the film would only stay curved the same way. The trouble is that it doesn't stay put. The heat of the projector and the current of warm, dry air passing over the surfaces of the film cause it to change shape while the slide is being shown. Sometimes it "pops," snapping from a curve in one direction to a bend in the other. This makes the focus change while you are watching the picture on the screen. Projectors that operate at extremely low temperatures with very effective cooling systems will handle cardboard slides without popping. Up to now this is possible only with units of 300-watt capacity or less.

The ability of a slide to withstand heat depends in some degree on the picture itself. Transparencies with large, black areas absorb much more light than they transmit, and it is converted into heat. If you have a projector that runs too hot, the effect will be noticeable if you examine your darkest slides with special attention to film buckling.

tilt controls

A mechanical aid to projection that you need every time you set up your projector is its tilt control. The least-expensive units sometimes have brackets that must be pulled out to the proper length and then fastened in place by turning a knob. More convenience is afforded by tilting mechanisms which raise and lower the front of the

projector as you turn a wheel or knob, providing an adjustment that is easily controlled.

Side tilt is of use when you find that your projection table or the floor of the room is not perfectly level in relation to the screen. It is built into some de luxe models and usually is provided by making one of the two front or rear legs of the projector adjustable in height. With the aid of a book or two, you can get any degree of tilt you want with any projector. The low-priced units provide a minimum of flexibility. More costly ones offer a wide range of easy adjustment.

slide changing systems

The simplest slide changers have no moving parts at all. A slide is fed into the projector aperture and appears on the screen. Then the next slide is inserted, and as it moves into place it pushes the first one out of the way. The effect you see on the screen is as if one slide were chasing the other off from left to right, lagging behind it by a distance equal to their combined side margins. Springs hold the slides flat against the projector head at the picture aperture, and retain the one that has just been shown until you are ready to remove it and return it to your file drawer. This changing system is economical to manufacture and since all slides are located by tension against the same picture aperture it produces a minimum of focus variations when they are uniformly mounted.

The next-simplest changer makes use of a carrier with left and right slide pockets which shuttles back and forth as pictures are shown. The carrier pockets usually are spring-loaded to press the slides against the same surface every time. As you look at the screen, one picture moves off it to the left and is followed by a complete blacking out of the screen area until the next slide moves into position from the right. The next cycle begins with the slide moving off to the right. Thus pictures alternately appear and disappear in motion to the left and right. Experts who have studied such things report that an audience tires more quickly when the pictures move onto the screen from alternate directions than it does when they keep moving the same way.

Another type of carrier with two slide pockets is the rotary one. It is a big disk with slide containers at its opposite sides. A slide is inserted at the top of the disk, and then the disk is rotated to bring it around and down into the picture aperture. While it appears on the screen you remove the previous slide from the pocket at the top of the disk and replace it with the next one. A big advantage of this type of carrier for informal showings is the fact that the slides are inserted right side up, instead of upside down as required by all other types of units. If you are going through slides and selecting a few for showing by looking at the pictures themselves, it's easy to insert them right side up after looking at them. It is very important to make sure the rotary carrier remains in perfect alignment. If it gets knocked out of line by accident, every slide will have to be focused individually even if perfectly mounted.

More-advanced changers are designed for operation from one side of the projector. You insert the slide in a pocket and push a lever which closes a shutter that darkens the screen and also pushes the slide into the projector aperture. Then you pull the lever to remove the previous slide and open the shutter again. With this system slides always move in the same direction. Usually all movement takes place during the brief blackout period between slides. This type of changer is most important because its design paved the way for the first automatic magazine changers, built to take a whole file drawer full of slides and project them without individual handling. The devices that developed from it will be discussed below.

PART 5— AUTOMATION

The big recent news in slide projectors is automation. The word "automatic" has been used in many different ways. Probably the first reasonably correct usage was when it was applied to a slide-changing system that made it possible to show a series of pictures in sequence without touching the slides with your hands. More recent developments have resulted in projectors that need only be loaded with a magazine of slides. From there on they will run themselves.

Automatic projectors of the reel and drum type have been on the market for many years. Designed for continuous automatic-display purposes, they present a series of pictures over and over again. They are fine for commercial use, but lack the flexibility required for amateur slide showings.

The first automatic projector designed for the amateur was the LaBelle, built to take a whole stack of 2x2 slides at once. Pushing a lever at the rear of the projector housing puts the machine through its entire changing cycle, throwing a new slide on the screen and depositing the one pre-

viously shown in a magazine in its base. Power-driven models relieve the operator of the job of pushing the lever. A remote-control cord enables him to put on the show from any location, merely pushing a button to make the changer work.

An entirely different approach to automatic changing was developed in accessory carrier units designed to fit existing projectors. GoldE and Three Dimension Company brought out changers which were built to take special, slotted magazines of slides. These made it possible, for the first time, to project slides automatically with a push of a lever and also to achieve flexibility enough to permit skipping slides and moving backward or forward through the magazine at will. These units were designed by projector manufacturers to fit their own machines. Airequipt Manufacturing Company followed with an automatic changer designed to provide essentially the same type of operation with other projectors on the market, and additional manufacturers brought out their own models. Now you can get automatic changing of this type for almost any projector you choose except the minimum-cost machines, either as a feature of the projector itself or by buying an accessory changer unit.

All these automatic changers are designed to do the same thing, but they accomplish it in different ways. If you already have a projector and want to buy a changer for it, chances are your selection will be dictated by what is available to fit it. If you are looking for both a projector and changing unit, you'll want to look over the outfits on the market and see which one offers the best service for the way you like to put on a show. If you like to set up a sequence of slides and then stick to it, flexibility won't appeal to you. If you prefer to skip around in presenting your pictures, you will rate easy flexibility of operation higher than simple operation in a straight, predetermined sequence.

Another major step in the development of automatic projection came with the introduction of the Revere 888. It is a power-driven outfit which goes through its entire changing cycle at the push of a button on the machine or at the end of a remote-control cord, and also has its own timing mechanism to present a whole magazine of slides at predetermined intervals. Settings on the machine permit you to select intervals of different length, or to choose slides manually by number when you want to depart from their sequence in the magazine. You can move either way, forward or back. The automatic changing cycle of the 888 begins when its changing mechanism is energized, either by your finger pushing the button on the machine or at the end of the remote-control cord, or by its own automatic timing device. First, an iris diaphragm closes to darken the screen. Then the motor-driven mechanism pushes the slide which has just been viewed back into its own compartment of the magazine. When the former slide has been replaced, the next one in line is withdrawn and moved into the projector aperture. As it comes to rest, the iris diaphragm opens again to throw the picture on the screen. All this takes time, and there is a brief but noticeable period of about three seconds that the screen is dark while the changer is operating. When you switch the projector over to "manual" operation you merely select the slides you want by number, in any order, by turning a knob. Pressing the change button then delivers the slide to the aperture and throws it on the screen.

While changing sequence is possible with automatic and semi-automatic projection systems, it isn't easily accomplished unless you have your slides well cataloged. You can't look at the slides themselves while they are in the magazine. You need a list of slides, by number and description, to select a portion of a magazine for showing and to get the pictures you want. This is no hardship if you are accustomed to keeping your pictures well organized, but it's a far cry from spreading slides out on the projector table for selection.

Already more new slide projectors and changing units of the automatic and semi-automatic type are beginning to appear on the market and are sure to be followed by many others. Here again, selection depends on how you like to put on a show.

An exciting possibility of automatic projection is the single-package show of slides plus commentary and background music recorded on magnetic tape. Everything needed to make it a reality now has been developed or is in sight. Projectors that go through the changing cycle when energized by an electric impulse make it possible to cue changing with a tape recorder. The cue may be an extremely low or high tone of a frequency that puts it near the limits of the audible range, or it may be a measured interval of a particular tone or of silence.

It isn't everyone who wants to go through the elaborate preparations required to put together a program of this sort, but the facilities are at hand for those who want to make use of them. Motion-picture fans converted to slide photography probably are the most likely prospects. They know the value of timing, and magnetic-stripe movies have already given them practice in putting sound and pictures together to tell a story.—

For a complete listing of modern slide projectors, see the POPULAR PHOTOGRAPHY *Directory and Buying Guide which comes out each spring. It describes them all with illustrations, prices, and information on accessories. And to keep up to date on new developments in the slide projector field, watch for new product announcements in the* Trade Notes and News *department of this magazine each month.*

HOW WEEGEE MADE HIS CARICATURES of 4 famous photographers

(see pages 44-45)

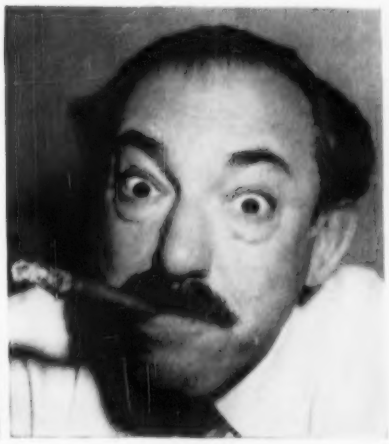
WEEGEE SITS FOR HIS OWN CARICATURE ASSISTED BY VICTOR KEPPLER

WEEGEE USED THESE "STRAIGHT" PORTRAITS

ALFRED EISENSTAEDT

YOUSUF KARSH

PHILIPPE HALSMAN



VICTOR KEPPLER

ALTHOUGH he has had one of the most unpredictable careers in photography, it is probably no longer news that the Weegee of *Naked City*, who once casually described himself as "official photographer of Murder, Inc.," has turned from the world of raw realism to that of fantasy. Readers of this magazine have traced his strange course in such articles as *Mirror Magic* (p. 42, April 1953) and *Weegee's Kaleidoscope* (p. 52, February 1955), both dealing with distortion and multiple-image experiments. Recently, Weegee has applied these techniques to caricatures of eminent persons and has produced some of the best satirical portraits ever made by photographic means. When POPULAR PHOTOGRAPHY's editors saw this work, they invited Weegee to caricature four famous photographers: Philippe Halsman, Yousuf Karsh, Alfred Eisenstaedt, and Victor Keppler. The amusing results can be seen on pages 44-45.

It is easy enough to create distortion photographically by such means as relatively short lenses or by tilting the enlarger easel. The problem of caricature is to choose the distinctive and/or peculiar features of the subject and to exaggerate them. In photography this is no simple achievement. Perhaps only a Weegee could have brought it off. Sad-eyed, he toils away through the New York night in a locked, secret room like a troll in an old German fable. A coffee-maker maintains him through the long hours—"the time of fantasy" he calls it—while the rest of the city sleeps. There is a box of cigars on the shelf next to the enlarger, a phone and loudspeaker system both with cut-off switches so he won't be disturbed, and a couch to spell himself after every two hours of work.

Occasionally, if he is still on the premises during ordinary daylight work-

The Kodak BULLETIN

The Schoolboy

—and the bath that turns purple when pooped . . . double tips for more versatile flash . . . the slidefile that files like a book . . . 2¾ ounces of data to fit in your pocket . . . movie Kodachrome Film without processing included . . . the future shape of stereo . . . and the best way to filter a beginner

Future

We think the time is coming when knowing how to use a camera will be an important part of the education of young people. There is hardly an industry today that doesn't use photography to solve manufacturing problems, to communicate ideas, to help sell products, to record events. More and more photographs are used in books, periodicals, and newspapers. And more and more photography is being used in schools, both to teach and for illustrating reports and projects.

A youngster 8 years old is capable of using a Brownie Holiday Camera. He'll learn a lot about the world around him through its viewfinder, he'll learn how

to operate a simple instrument, he'll learn judgment and artistic discipline. And you'll learn a lot about how he thinks, through the pictures he takes. $8.15 is a small investment for all this.

As your youngster grows older—perhaps as he moves from Cub to Boy Scout age—you'll want to shift him to a better

camera such as the $24.50 Kodak Duaflex IV Camera with a Kodar *f*/8 Lens, focusing down to 3½ feet, three lens openings. He'll learn more about photography, how to make exposure decisions.

Then, as his knowledge grows and his interests expand, you can switch him to a basic miniature such as the Kodak Pony 135 Camera, Model C. Only $33.75, but it has an *f*/3.5 lens, a 1/300-

second shutter, and all the controls he needs to take fine color transparencies and black-and-white negatives. By now he'll know photography, how to use it, what it can do. And you'll have given him a training that will serve him well the rest of his life.

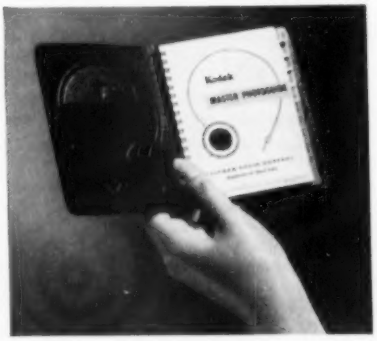
Advice

What do you tell a beginner in photography when he asks you which filters to start out with? Tell him to go down to his Kodak dealer and get a basic Kodak Filter Kit. The standard kit has just what

he needs to start with: a yellow Kodak Pictorial Filter, a Kodak Skylight Filter (Wratten No. 1A), a Kodak Daylight Filter (Wratten No. 85C) for using indoor color films outdoors, and an adapter ring if he needs one, all in a transparent plastic case with five individual swing-out compartments. The Kits come already made up for the most popular cameras, or the dealer can custom-make one for your friend's camera. Prices start at $6.00 including the case.

Data by the ounce

We have just been browsing through a 2¾-ounce encyclopedia of practical photography. It's the newest edition of



our $1.75 "Kodak Master Photoguide," a pocket-size pocketful of indispensable working data.

It contains, for example, five dial-type computers (for daylight shots, flood, flash, effective-aperture correction in close-ups, and field depth) . . . four viewing filters, to aid in selecting the right contrast filter for specific manipulation of color values . . . exposure indexes, flash guide numbers, filter data for color shots, fill-in flash data for daylight shots, data for extreme close-ups . . . guidance on shooting rainbows, sunsets, fireworks, floodlighted buildings, stage shows, night fires, Christmas trees . . .

If you're getting married, you find on Page 10 that the basic exposure for Niagara Falls, on Kodak Type F color film, under white floodlighting at night, is 30 seconds at *f*/4.5. Kodak thinks of practically everything. But this $1.75 master guide should turn *any* photo jaunt into a honeymoon. See your dealer for your copy.

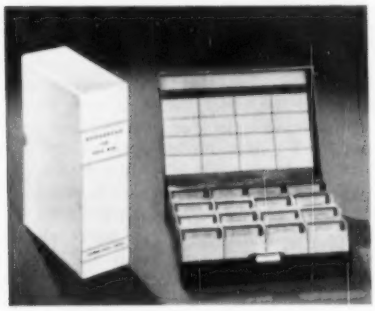
and the Camera

Note for movie-makers

For a while, your Kodak dealer may have 8mm and 16mm Kodachrome Film two ways—*with* processing included in the price, and *without* processing included. There's a difference in the purchase price, and in the way processing is ordered. Your dealer has the details. (Film which does *not* include processing has a big ★ and a notice on the box.) Eventually, all Kodachrome Film will be sold without processing included in the purchase price.

Bookcase file

Somebody has been doing a lot of clever thinking about packaging. The new Kodak Filter Kits are about the last word in filter cases—made of clear plastic with each filter housed in its individual swing-out compartment. And now comes the new Kodaslide 400 File Box. It looks like this:



The file box is on the right, its case on the left. The file box is made of a tough, molded plastic material with a handsome leather-grain finish on the front and back. Inside are 16 yellow Polyethylene Kodaslide Boxes to hold your slides neatly in subject groups—20 to 25 cardboard slides to a box, 400 in all (176 if they're glass slides). No trouble taking the individual boxes out of the file box. When you open the cover they all tip back ready for you to lift out.

Now, suppose you're going to show your slides on a Kodaslide Signet Projector. You select the box you want, take the slides out, and slip the box itself into the receiver of the projector. When you've run through the group, your slides are all back in their box in the original sequence—ready to show next time.

That's not all. The sturdy, leatherette-covered case (at left) lets you store the file box like a book. Price for the whole works, $5.75, in red or green. Take a look, at your Kodak dealer's. It'll be love at first sight.

Purple when pooped

How do you tell when your stop bath is all played out—without even stopping to make a test?

Answer: use Kodak Indicator Stop Bath. It's clear when active, turns purple when exhausted and then looks dark under your safelight. Comes in a convenient concentrated liquid form that takes just a moment to mix with water. 16-oz. bottle, $1.05.

The shape of stereo

We've been talking mostly about the pleasure of stereo, but let's not overlook its commercial importance. Peering into our crystal ball, we think we can see the time when almost every traveling salesman will carry a stereo viewer and a pocketful of slides showing his products. If you were selling 200 kinds of shoes, or a line of turret lathes or marble monuments—wouldn't you rather rely on three-dimensional full-color slides than carry samples?

Apropos of this, the sales manager who purchases an $84.50 Kodak Stereo

Camera would look smart indeed. For he can make slides of his products, furnish them to each of his salesmen, along with a $12.75 Kodaslide Stereo Viewer. You'd look smart for suggesting the idea, too.

No problem

What happens to your flash gun if you trade a camera with an ASA bayonet connector for a camera with a European-type connector? If your flash is a Kodalite Super-M Flasholder you just continue to use it on your new camera, for the Super-M comes with both ASA

and European-type connectors. If you own a Kodak Standard or B-C Flasholder, you'll be all set with a $1.10 Kodak Single-Post Flasholder Adapter to adapt it to the European connector. Even if your new camera has a clip-type flash connector, you're still in business with the same flash gun with a $1.35 Kodak Clip-On Flasholder Adapter.

The point we're making here is that Kodak Flasholders can be used with practically any camera.

Same goes for the Kodak B-C Flashpack. It's the best medicine we know of for *any* non-B-C flash gun, Kodak or otherwise, that uses two "C" batteries end to end. B-C gives precision-timed synch right up to the last gasp of the battery. Price, $2.95 (less battery), at your Kodak dealer's.

It presses the button

Back in the days of the first Kodak Camera, you sent camera, film and all, back to Kodak for processing, and we used the slogan, "You press the button, *we* do the rest." Later, we bragged about Kodak film: "You press the button, *it* does the rest." Now comes the Kodak Auto-Release: *It* presses the button, and all you need do is get into the picture. It performs this service for any camera that uses a cable release; costs only $3.86. You need one.

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Weegee's Caricatures

(Continued from page 77)

ing hours, a voice will announce through the loudspeaker, "Weegee, someone to see you." Then this gremlin with open-collared green-flannel shirt, startling baby-blue suspenders, and the ruins of a once-spectacular bay window shuffles into the outside world, locks the door behind him, and tells the visitor something of what he has been doing. The place is the Authenticolor Lab on Park Avenue, a color-processing firm for some of the most famous names in commercial and magazine photography. Here Weegee, teamed with Authenticolor's owner Mike Lavelle, has been creating a whole genre of photographic caricature.

How does he do it? He won't say—just yet. Not because of any coyness or perversity, but simply because he feels that any interested photographer who wants to get the same kind of comic, penetrating effects should not ask him to give away his hard-earned knowledge at this stage of the game—when editors and art directors are keeping him totally occupied with caricature assignments. If anyone wants to follow in his footsteps, he says: "Let him find his own way and I hope he does a good job."

Through the hedging our editors were able to distinguish only a few hard facts about Weegee's secret technique. He usually works from a straight transparency of any size and this is rephotographed through a prismatic device of his own invention which is attached to a modified Omega enlarger. The gadget is sometimes used on a camera and then the caricature is made directly during the shooting session. The four caricatures printed in this issue were made by the enlarger method.

Weegee traces his interest in caricature from a stint in Hollywood when he acted as technical adviser on the film version of *Naked City*. One day, musing on the hundreds of photographs sent to the studios each month by hopeful mothers of would-be Shirley Temples, Weegee thought: "Now if a woman had a two-headed kid . . ." Thus was launched that bizarre collection of disconcerting candid shots and preposterous caricatures called *Naked Hollywood*.

The work on manipulated and trick still pictures (as well as experimentation with movie distortion) led him toward a goal which had always intrigued him. It was the old dream of doing with a camera what an artist does with brush and paint to capture complete control of expression, color, line, and shape—in short, to "do the imposible" with the camera and purists be damned.

Because of the complexity of his techniques, which include elaborate color compensations, the need for a full color lab was clear. At this point Mike Lavelle offered his skills and lab facilities to Weegee. Weegee is so much more concerned with the final effect of the caricature that the source of the original transparency is entirely secondary to him. Lavelle helps him considerably here, too, often shooting the subject in a straight version—although the final effect is kept in mind so that a characteristic pose or expression can be exploited. Intensive work for *Vogue* and *Look* has helped Weegee perfect his techniques, giving him an added excuse for the odd nocturnal working schedule which he has followed all his life.

The POPULAR PHOTOGRAPHY assignment to caricature Halsman, Karsh, Eisenstaedt, and Keppler was particularly successful because all four men were delighted to be approached (most people are, says Weegee) and none of them asked how he did it. On the other hand, Weegee complains, he can't spend a day now without being halted in the middle of Times Square by some "photographic egghead" who demands an explanation of the "Lens" or the "System" he supposedly uses.

In caricaturing his subjects, Weegee keeps two major points in mind: 1. No matter how much distortion is used, the subject must still be easy to recognize. 2. The caricature must be in good taste. On this latter point, Weegee insists that he has learned to hold himself back. The possibility of being completely devastating is all too likely and he wants to save his big guns for worthy subjects—Bulganin and Kruschev, for instance.

To make the caricatures of the four photographers Weegee began by asking their secretaries or acquaintances what was most characteristic of each of them, then he made his own observations, and lastly, but perhaps most important of all, he asked them directly. Weegee feels that people are amazingly conscious of their own facade and, if they are honest, can quickly recall characteristic gestures and expressions.

The circumstances of the Eisenstaedt portrait session may be considered typical—if a three-ring circus is your notion of the typical. In this case Weegee went to *Life's* photographer's room for the sitting. It was the first encounter between Weegee and Eisenstaedt and most of *Life's* photographers came in to observe the occasion. Things began slowly since for the first time in his life Weegee had difficulty with his flash. (He later commented: "It's a good thing that never happened to me when I was a police reporter—after all, I couldn't expect the corpse to stay still for long.") In a moment Lifemen Gordon Parkes and Eliot Elisofon were recruited as assistants and repairmen. All the while Lisa Larsen watched the uproar from a vantage point she had taken up in a closet. The session culminated in this brief dialogue:

WEEGEE: What's your personality?

EISENSTAEDT: I'm a mimic.

WEEGEE: Make like Liberace!

EISENSTAEDT: Who's Liberace?

The result (after a flashless session followed by reshooting later in the week): a caricature of Eisenstaedt mimicking Weegee's imitation of Liberace.

To all those who have seen his pictures and who want Weegee to caricature them, this professional eccentric, gadfly, and scandalizer replies: "You *are* a caricature." Then he retreats to the locked room, the coffee-pot, the cigars, and the secret formulas.—▶

CALENDAR OF EXHIBITIONS

*Conducted according to the recommended practices of the Photographic Society of America.

16th North American International Photographic Exhibit*, California State Fair and Exposition and Sierra Camera Club, Sacramento, Calif.
Closes August 9 (slides).
Entry fee $1, four prints or slides.
On exhibit at Administration Bldg., State Fair Grounds, Sacramento, August 29 through September 9, 1956.
For information and entry blanks, write California State Fair and Exposition, Box 2036, Sacramento, Calif.

9th Illinois State Fair International Exhibition of Photography*, Capitol City Camera Club, Springfield, Ill.
On exhibition at the Illinois State Fair, August 10 to 19, 1956.

5th Photographic Salon, Sandy Bay Camera, Rockport, Mass.
Closes August 10, 1956.
Entry fee $2, number on request.
On exhibition at Community House, Rockport, Mass., August 26 through September 5, 1956.
For information and entry blanks, write Obert A. Hagen, 18 Chestnut St., Gloucester, Mass.

11th South African Universities and International Youth Salon of Photography, Witwatersrand University Photographic Society, Johannesburg Festival of International Photography, Johannesburg, South Africa.
Closes August 11, 1956.
Entry fee $1, six prints allowed.
On exhibition at Duncan Hall, Johannesburg, September 19 to 29, 1956.
For information and entry blanks, write Salon Secretary, 11th S. A. Universities and International Youth Salon of Photography, P. O. Box 10953, Johannesburg, South Africa.

Evergreen Empire Exhibition of Color and Nature Photography, Bremerton, Wash.
Closes August 13, 1956.
Entry fee $1, four slides allowed.
On exhibit at Kitsap County Fair, Bremerton, August 23 through 26; at Seattle, August 27 through September 3.
For information and entry blanks, write C. W. Biedel, M. D., Evergreen Empire Exhibition, Box 1236, Station A, Bremerton.

10th Yolo County International Exhibition of Photography*, Woodland Camera Forum, Woodland, Calif.
On exhibition at Yolo County Fair, Woodland, August 16 through 19, 1956. Prints to be shown at Crocker Art Gallery, Sacramento, August 24 through September 9; slides at Crocker Art Gallery, August 24.

12th Salt Lake Photochrome International Exhibition of Color Slides, Salt Lake Photochrome Club, Salt Lake City.
Closes August 18, 1956.
Entry fee $1, four slides allowed.
On exhibition in Salt Lake City, September 12 through 15.
For information and entry blanks, write Mattie C. Sanford, Chairman, 1426 S. 11th E., Salt Lake City.

1st Color Slide International Exhibit*, The World and Its Colors at Naples, Associazione Fotografica Napoletana and Federazione Italiana Associazioni Fotografiche, Naples, Italy.
Closes August 20, 1956.
Entry fee $1, four slides allowed.
On exhibition at the Piedigrotta Feast in Naples during September.
For information and entry blanks, write Associazione Fotografica Napoletana, c/o Altieri-Spedizioniere, Via Vincenzo Russo, 15, Naples, Italy.

17th Vancouver International Salon of Pictorial Photography*, 3rd Vancouver International Color Slide Exhibition*, The Pacific National Exhibition and The Vancouver Photographic Society, Vancouver, B. C., Canada.
On exhibition at Pacific National Exhibition-International Hobby Show, Vancouver, B. C., August 22 through September 3, 1956.

3rd International Salon of Photography of Mocambique*, Portuguese East Africa.
Closes August 31, 1956.
Entry fee $1, four prints allowed.
On exhibition at Building of Organismos de Coordeñacao Económica, Lourenco Marques, Portuguese East Africa, September 15 to 30, 1956.
For information and entry blanks, write International Salon of Photography of Mocambique, P. O. Box 861 or 327, Lourenco Marques, Portuguese East Africa.

1956 Northwest International Photographic Salon*, Western Washington Fair, Puyallup, Wash.
Closes September 1, 1956.
Entry fee $1, four prints allowed.
On exhibition at Western Washington Fair, September 15 to 23, 1956.
For information and entry blanks, write Western Washington Fair Association, Puyallup, Wash.

8th Pittsburgh All Color Exhibit International*, The Natural Color Camera Club of Pittsburgh.
Closes September 4, 1956.
Entry free $1, four slides; $1, four color prints.
Prints on exhibition at Arts & Crafts Center, Pittsburgh, October 6 through 22; slides shown at Arts & Crafts Center, September 16 and 23 and Belles Lettres Club, Oil City, Pa., October 6.
For information and entry blanks, write Myron B. Sharp, General Chairman, 114 E. Manilla Ave., Pittsburgh 20, Pa.

31st International Fotosalon*, Van Fototclub, "Vooruit," Ghent, Belgium.
Closes September 8, 1956.
Entry fee $1, four prints allowed.
On exhibition at Ghent Salon, October 28 to November 28.
For information and entry blanks, write Julien Tack, Secretary, Nieuwland 37, Ghent, Belgium.

1st Fresno International Salon of Photography*, Fresno Camera Club, Fresno, Calif.
Closes September 12, 1956.
Entry fee $1, four prints allowed.
On exhibition at the Fresno District Fair, October 5 to 14, 1956.
For information and entry blanks, write Elmer Lew, 1112 W. Andrews, Fresno 5, Calif.

1956 Newcastle upon Tyne International Exhibition of Photography*, Newcastle upon Tyne Photographic Society, Newcastle upon Tyne, England.
Closes September 12 (prints); September 26 (slides).
Entry fee $1, four prints; $1, four slides.
On exhibition at the Laing Municipal Art Gallery, Newcastle upon Tyne, October 13 to November 3, 1956.
For information and entry blanks, write Mrs. D. Walker, 37 Newminster Rd., Newcastle upon Tyne 4, England.

Central Washington 3rd International Photographic Exhibit, Yakima Camera Club, Central Washington Fair, Yakima, Wash.
Closes September 12, 1956.
Entry fee $2, four prints allowed.
On exhibition in Yakima, September 26 through 30, 1956.
For information and entry blanks, write Yakima Camera Club, P. O. Box 719, Yakima, Wash.

4th Annual International Exhibition of Colour Photography*, Stockton-on-Tees Photo-Colour Society, Stockton-on-Tees, England.
Closes September 14, 1956.
Entry fee $1, four slides, stereo slides, or Viewmaster reels and four color prints allowed.
Exhibit opens October 6 in Holy Trinity Hall, Yarm Lane, Stockton-on-Tees, England.—

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Color Retouching

(Continued from page 41)

everywhere. Two products, Colorflo and Authenticolor Dyes, are special preparations of our own which have been developed and improved after many years of use. They may be purchased directly from Authenticolor at 270 Park Avenue, New York City. However, similar products of other companies are obtainable easily elsewhere.

Underexposed (dense) transparencies

When color is underexposed, the result is excessive saturation of all colors. Such a transparency can be lightened by three selective bleaches, used one after another. The bleaches are different for the three color films covered in this article: Ektachrome, Anscochrome, and Kodachrome. The formulas, together with time and temperature recommendations based on long experience, are given at the end of the story. They are designed to reduce color approximately equivalent to the correction of a CC 20 filter, and a density of 15 percent.

Here's how the color reduction works. Suppose a transparency has a normal color balance, but is about 30 percent too dense. This would require bleaching out 10 percent each of yellow, cyan, and magenta (always in that order, by the way). Again, if the transparency is equally dense, but has more of an excess of one color than of the others, it might need a weighted bleaching of, say, 7½, 7½, and 15 percent in the respective solutions. This might be the case, for example, in an underexposure made by late afternoon sunlight, when reddish tones would predominate, and the magenta bleach would be used for the longer time.

Judging the degree of density and the proportion of color unbalance is a skill not difficult to acquire. Of course it is always best to experiment at first with a few discarded transparencies. With Kodachrome and Anscochrome, the bleaching process can be observed while it takes place, and stopped when the correct stage is reached. This is not the case with Ektachrome, which takes on a brownish opalescent cast when wet.

Overexposed (thin) transparencies

It would be ideal if the color layers of a thin transparency could be built up chemically, as they can be reduced. Unfortunately, no one has yet discovered how to do this. But there is a very satisfactory way of intensifying the colors with water-soluble aniline dyes, used by immersion and local application. The chart on page 43, for simplicity, lists immersion only. That procedure can be used by itself only when a single color is lacking. It can be supplemented by brush application where other colors need intensifying. Again, remember that Ektachrome emulsion discolors when wet, so before immersion, tape the film to a piece of glass, emulsion side down; and do all handwork on the back of the transparency.

Application of color with a brush does not require training and experience. Even on very small transparencies, dye can be applied with sufficient precision even by a person with no artistic skill. Since color intensity is always built up by repeated applications of rather weak dye, a slip of the brush will not ruin the picture, and if color is accidentally made too intense it can be lightened by swabbing with water. The most convenient way of working is with a dampened bit of cotton wrapped around the end of the brush stem, to blot up excess dye as you go.

Prepare the colors by mixing basic dyes in small glasses. Blend them and reduce their intensity on a small ceramic water-color palette or a white plate. Choose a brush suited to the job; a medium-sized one which will hold a lot of color for large areas, a small one that can be finely pointed for detail work. If you do not have a light box, you can improvise one with a sheet of opal glass and a small lamp. To avoid eyestrain, cut a mask from black paper, leaving an opening the size of the transparency.

Remember to work slowly, with weak dyes, adding layer upon layer as the color is absorbed into the film. A caution: with the immersion method, highlights tend to become overcorrected beyond a certain point. The color can be swabbed off, but if there are large, clear highlight areas, it may be better to apply color only with a brush.

To determine the shade and degree of color the transparency needs, examine it on a light box through a series of standard color-compensating filters. These come in graduated intensities of yellow, magenta, and cyan. When you find the one that restores color balance to the transparency, simply mix dye to match it and apply by brush or immersion.

Excess of one color

"I should have used a filter!" That is a common lament among professionals as well as amateurs. Early and late sunlight impart a warmness to color shots that takes the form of red or yellow cast, or a combination of the two. Pictures made in shade and certain landscapes have a tendency toward excess blue. And indoors there are numerous factors that can influence color balance—reflecting surfaces, expiring floodlamps, a combination of daylight and artificial light. It is no longer necessary to discard such overbalanced transparencies. The selective bleaching formulas at the end of this story have been carefully tested to give predictable reductions of all three colors. They are the same formulas used for bleaching underexposed transparencies, but of course only the one necessary bleach is used. Remember again that with Ektachrome it is advisable to experiment on discarded film, because even though precise instructions are given, there may be subtle variations due to emulsion, exposure, and processing. With the other films, you can observe the process and be guided accordingly.

Lack of one color

In a transparency which seems to lack

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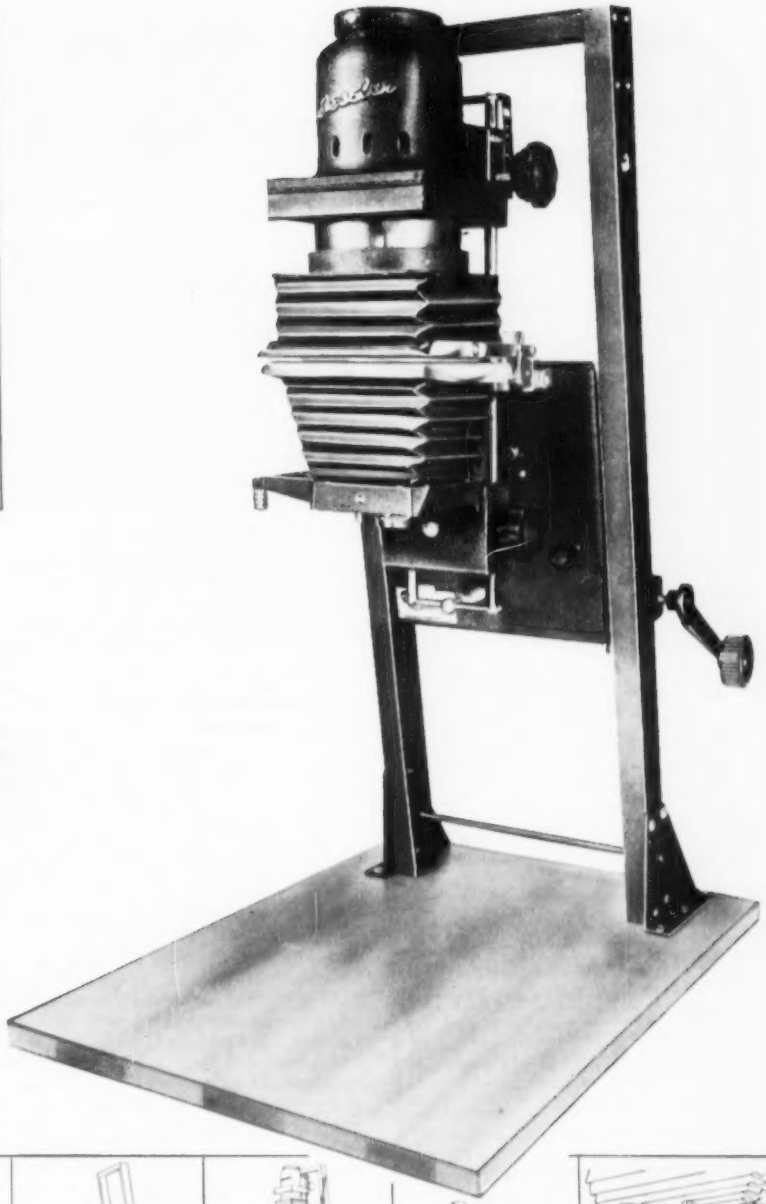

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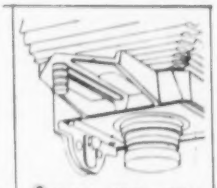

8 Built-in Sliding Filter Drawer at lens stage accepts Safety, Printon, Varigam, Diffusion, Portrait and other filters!

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GENERAL HINTS

1. There are many brands of water-soluble aniline dyes on the market. Authenticolor dyes, developed through years of experience, are designed expressly for transparency retouching. Other good dyes are those made by Webster, and the Kodak Flexichrome colors.

2. Use a wetting agent like Authenticolor's Color-Flo or Kodak Photo-Flo in mixing all dyes, to help colors go on smoothly and prevent streaking. Use it also to presoak all transparencies before bleaching. For both purposes the formula is the same: 5 grams Color-Flo or ten drops of Photo-Flo to 16 ounces water. The solution is also recommended as a dip before drying.

3. As a general rule, always apply dye in concentration weaker than the color intensity desired, and build up by repeated application. Keep a cotton swab handy, dipped in wetting-agent solution and wrung out, for blotting up excess color as you work.

4. The bleach solutions have poor keeping qualities after mixing. They should always be mixed just before use, in only the quantity needed. Temperature and agitation rate must be kept uniform for consistent results.

5. When working with Anscochrome, never permit bleaching solutions or wash water to go above 70 F, or frilling of emulsion may result. With Kodachrome and Ektachrome, temperature may go as high as 75 F.

a bit of one color, it can be added by the procedures given for overexposed film, with water-soluble aniline dyes. The immersion method is very satisfactory if the degree of correction required is not great; too much soaking will naturally discolor the highlight areas. This overcorrection can in turn be corrected simply by soaking in water. If only parts of the picture need added color, it may be more practical to apply it with a brush. This can be done on the reverse side of Anscochrome and Ektachrome by taping the film emulsion-side-down to a sheet of glass, as described above. This prevents moisture from reaching the emulsion. It is not possible to work on Kodachrome in this way, since it lacks the necessary coating on the back. When color is thus applied with brush or swab, the clear highlight areas can easily be avoided, and any spilling over of color due to carelessness can be corrected by swabbing with water.

Large areas washed out

This defect, as well as the one that follows, have been separated from the preceding one mostly for purposes of illustration. The correction techniques are largely the same for all three, involving the use of dyes. When large portions of the picture lack a single color, the immersion process is generally best. If it is a blank sky to which you want to add blue, or a similar problem in which you do not want other areas affected, you can easily mask the area to be protected. Use

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frisket tissue, a material available in art supply stores. Place a sheet over the transparency and cut freehand, using a light stroke with a sharp knife or razor blade; remove the part covering the area to be dyed, and fasten the rest with rubber cement if it is not self-adhesive frisket. The film is then ready for immersion. Swab application is also useful in coloring large areas, but care must be taken to use weak dyes to avoid streaking and unevenness.

Local areas washed out

This refers to cases in which small or isolated portions of the picture have lost color intensity by overexposure or by catching an unwanted glint of light, or in which you wish to add color accents where there was no color in the subject. Dye is applied with a small brush. It must be mixed to an intensity less than that desired in the picture, so that the color level can be built up by repeated applications. Have a piece of clear film or glass at hand to test intensity of the color after it has been mixed with water and Colorflo (or other wetting agent).

Except for Kodachrome, which has no dye-absorbing coating on the back, it is best to apply color to the reverse side of transparencies. The primary reason is that progress cannot be observed with the other two films when the emulsion is wet. Also, unwanted color may be removed from highlights with a swab of household ammonia, and this must *not* be used on the emulsion side because it tends to bleach the film's own colors.

For the same reason, ammonia must never be used on Kodachrome, since dye can be applied only to its emulsion side. Fortunately, however, that film does not discolor when wet, so you can avoid excess coloring by working slowly and watching your progress.

Backgrounds—wrong color or undesirable

If a picture has been taken against a white or very light background, you can add color by the technique described above. But if the background is of an undesirable color or contains distracting elements, more radical treatment is indicated. The entire emulsion can be removed by brief immersion in ordinary household bleach, such as Clorox, di-

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luted with about three parts of water. Naturally all other areas must be protected from the chemical, so frisket is applied as described above, or the areas are coated with nail lacquer on the emulsion side. In either case, of course, the film must be securely taped to glass before immersion to avoid affecting the back coating, to which you may want to add color later. When the emulsion has been removed, rinse the glass-mounted transparency under running water, then remove the nail polish with regular remover or acetone. After this, wash the film in cold water, 60-70 F.

As has already been suggested, you can add whatever color you like to the reverse side of the film. To simulate clouds convincingly, brush on solid blue, then remove dye from small areas with ammonia.

Light streaks and pinholes

Streaks on transparencies, caused either by stray light during exposure or by faulty processing, can be concealed with dyes. The technique is a little more difficult at first, since you must usually make the added color match that of the surrounding area (see the example on page 42). You may find, for example, that a sky is not of the same blue as the aniline dye you are using, and that you need to add a drop of yellow or magenta. Here again the sheet of clear film or glass is handy for side-by-side comparison. Sometimes a streak will be caused by the absence of only one of the component hues in a solid area. For example, if there is a bluish streak in a green area, you will need to add only yellow. A little practice on discarded film will give you great proficiency in color matching in a short time.

With Kodachrome, apply dye to the emulsion side; with Ektachrome and Anscochrome work on the back of the support.

A note on portrait retouching

Anyone who has done simple negative retouching or even print spotting can "clean up" a portrait transparency. The trick is to blend or soften hard lines, and fill in light areas. This applies to facial lines, wrinkles, blemishes, or other defects. Small dark or black spots or lines cannot be bleached out or removed easily, nor should they be taken out with an etching knife. The procedure therefore is to soften these small dark areas, to make them less apparent. This can be done by stippling either with dyes and a fine sable spotting brush or with the same retouching pencils used for black-and-white work. Also, certain types of crayon pencils, such as Eagle Prismacolor, can be used for blending.

When using dye, first blend the hue desired in a small dish, then take up some dye with a wet brush and roll it on a sheet of paper to test its intensity and also to create a fine point on the brush. Stipple (by just touching the brush point repeatedly to the film) around the edge of the dark area until it blends into surrounding areas. Remember: emulsion side with Kodachrome, reverse side with Anscochrome and Ektachrome.

SEE FORMULARY ON NEXT PAGE

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Kodachrome as processed by Eastman Kodak is coated with a protective lacquer finish on the emulsion side. This coating must be removed before any bleaching is done. It can easily be removed by soaking the transparency in sodium carbonate or ordinary developer solution for about 1 minute. Wash for 5 minutes, wiping stray lacquer patches with swab of cotton. Soak for 1 minute in Color-Flo before drying.

YELLOW

Presoak transparency for 1 minute in Color-Flo.

Sodium hypochlorite, 5%, or Clorox	8 cc
28% acetic acid	11 cc
Water to make	1 quart

Use at 68 F for 40 sec. Wash for 10 minutes 68-72 F. Rinse 30 sec in Color-Flo before drying.

MAGENTA

Presoak for 1 minute in Color-Flo.

Water	15 ounces
Sodium carbonate	8 grains
Sodium hydrosulfite	60 grains
Water to make	1 quart

Use at 68 F for 1 minute, rince in 5 cc of 28% acetic acid in 1 qt of water. Wash 10 minutes, then rinse 30 sec in Color-Flo before washing.

CYAN

Presoak for 1 minute in Color-Flo.

Water	10 ounces
Sodium sulfite	16 grams
Sodium bisulfite	16 grams
Alcohol (methanol)	12 ounces

Use at 68 F for 1 minute. Wash 10 minutes. Rince 30 sec in Color-Flo. Dry.

Note: These time and temperature instructions, if carefully followed, will result in a reduction of color equivalent to an Eastman CC20 filter. With Kodachrome this change can be observed during the time it is in the tray being bleached. However, the final result is not evident until after the film has been dried. For more color change, keeping film in the bleach for longer time will reduce more color; less time will remove less color.

EKTACHROME BLEACH E-1 & E-2 YELLOW

Presoak for 1 minute in Color-Flo.

Water	8 ounces
Potassium bichromate	9 grams
Sodium bisulfate	20 grams
Sodium sulfate	200 grams
Water to make	16 ounces

Use at 75 F for E-1, 1 minute; for E-2, 3 minutes. Rinse in Color-Flo 30 sec and wash.

MAGENTA

Presoak for 1 minute in Color-Flo.

Water	10 ounces
Stannous chloride	4 grams
Water to make	16 ounces

Use at 75 F for E-1, 5 minutes; for E-2, 15 minutes. Rinse in Color-Flo and wash.

CYAN

Presoak for 1 minute in Color-Flo.

Use liquid undiluted chlor-hydroquinone.

Use at 75 F, 1½ minutes for E-1 and 2½ minutes for E-2. Rinse in Color-Flo and wash.

Note: Since Ektachrome turns an opalescent dark brown when it becomes wet on the emulsion side, it cannot be observed accurately while bleaching. These instructions will give you a 20-cc filter change if carefully observed. For more or less color change, keep more or less time in the bleach. Also note 75 F to be used.

ANSCOCHROME BLEACHES

YELLOW BLEACH

68 F

Presoak for 1 minute in Color-Flo.

Stock Solution A

Clorox .....30.0 mg
Water to ..... 1.0 liter

Stock Solution B

Acetic acid glacial .....10.0 mg
Water to ..... 1.0 liter

Working Solution:
2 minutes
80 parts water
4 parts A
1 part B

Rinse 30 sec in Color-Flo. Wash 10 minutes.

MAGENTA BLEACH #1

68 F

Presoak for 1 minute in Color-Flo.

Solution A

Hydrochloric acid, concentrate .....5.0 mg
Water to .....1.0 liter

Solution B

Color-Flo ..... 1.0 gram
Sodium carbonate .....37.5 grams
Sodium hydroxide ..... 0.5 gram
Water to ..... 1.0 liter

Immerse transparency in Solution A 2 minutes, then in Solution B 1 minute.

Rinse 30 sec in Color-Flo. Wash 10 min.

MAGENTA BLEACH #2 (Alternate)

68 F

Presoak 1 minute in Color-Flo.

Solution A

Sodium bisulfite ..... 5 grams
Sodium bisulfate ..... 5 grams
Water .....16 ounces

Solution B

Sodium carbonate ..... 5 grams
Water to .....16 ounces

Immerse transparency in Solution A 3 minutes.

Wash 5 minutes between solutions.

Immerse in Solution B 1 to 3 minutes or until color is restored.

CYAN BLEACH

68 F

Presoak 1 minute in Color-Flo.

Stock Solution A

Hydrogen peroxide (medicinal concentration)

Stock Solution B

Color-Flo ..... 1.0 gram
Sodium carbonate .....37.5 grams
Sodium hydroxide ..... 0.5 gram
Water to ..... 1.0 liter

Working Solution:

Add 25 cc of Solution A to 1 liter of Solution B. Bleach 3 minutes.

Rinse 30 sec in Color-Flo. Wash 10 min.

Note: Anscochrome must not be bleached or washed at any temperature higher than 68 F or frilling may result.

Calendars Need Your Color

(*Continued from page 57*)

ly well for what he wants, but is not interested in anything else. It is what you put on those few square inches of film (and the way you do it) that will make the difference between acceptance and rejection.

What then does it take to crack the profitable calendar market? Technical excellence and appropriate subject matter are the two basic requirements of a salable transparency.

Assuming that you are a careful worker (and those who aren't are headed for disappointment) you will probably find that the calendar publisher is technically no more demanding than you are yourself. Specifically, your tranparencies must be sharp. They must be correctly exposed with good detail in highlights, middle tones, and shadows. Pictures should be well composed; the principal subject should dominate the picture and be arranged in a way that looks right. There should be no extraneous detail if it possibly can be avoided.

Another appealing feature of this market from the amateur point of view is the type of subject matter calendar buyers want. Despite what you may have seen on the walls of barber shops and gasoline stations, long-legged, scantily clad pin-up girls rank far from the top of the list of buyer preferences. *The Photographers' Guide to Calendar Publishers*, $1.00, published by The Lofthouse Company, Box 832, Binghamton, N. Y., is the standard market list for the field. It gives detailed buying preferences of the top calendar buyers who welcome free-lance submissions.

The biggest demand is for the type of picture that is accessible to most of us. Scenic pictures, for example, are the most wanted subjects by far and of all scenics, mountains lead in popularity. Following more or less in order are other landscapes, landscapes with people or animals, farm scenes, covered bridges, historical subjects, seascapes, gardens, churches, old homes, and so on.

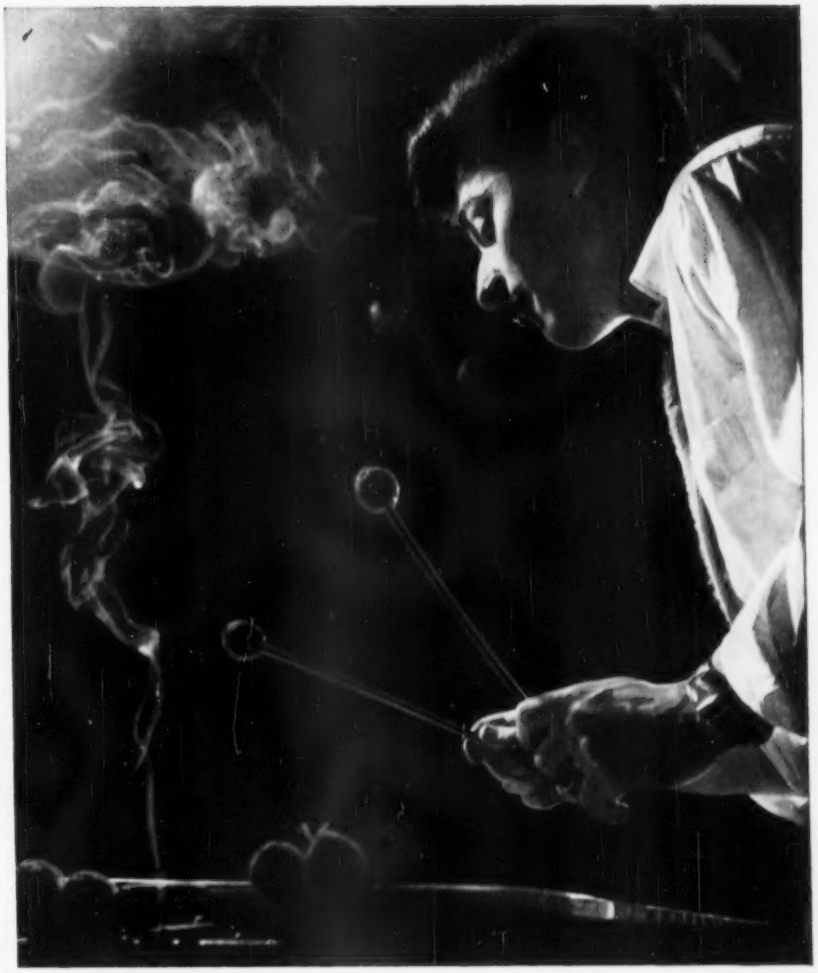
Sports and action subjects represent the second most popular category of calendar illustrations. Within this group fishing scenes rank first, followed in order by pictures of hunting, sailing, and camping.

Pictures of people constitute the third most popular subjects for calendars. Within this group, the undisputed leaders are story-telling human-interest pictures. Other favored subjects are children alone or with pets, babies, mothers and children, and humorous situations involving people. Pretty girls come next, with bathing girls, pin-ups, and nudes finishing in about that order.

Animals rank next in desirability. Dogs, as you probably surmised, run first, followed by cows, horses, and cats.

Although many photographers do not realize it, there is a small but persistent

Photographer H. Leonard sets his camera at 1/100 and *f*.16; a Press 25, off the camera, gets the picture.



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demand for still-life transparencies, primarily of tastefully arranged floral subjects.

The foregoing, then, are the most popular and in greatest demand among calendar-picture buyers. This does not mean, of course, that every calendar house has the same preferences in any given category. One company, for example, puts well-known tourist attractions high on its list of scenic needs. Spectacular transparencies of such landmarks as Natural Bridge, Va., Niagara Falls, the Hudson Palisades, the Grand Tetons, Carlsbad Cavern, and Crystal Springs sell better than locales that are unknown. To offset this, however, other publishers prefer more general scenes that might have been taken in any part of the country.

Another point to keep in mind in planning your sales strategy is that all publishers are not equally interested in all of the subjects listed here. Some publishers tend to specialize in some fields more than others, such as farm subjects, safety-first pictures, or illustrations featuring particular products. Because of this there is bound to be a certain period of adjustment while you are finding your way in the calendar market. With experience you will soon get to know the preferences of the individual buyers and learn to plan your submissions accordingly.

Obviously the trite picture will stand little chance of acceptance no matter how technically perfect it may be. For the photographer who is seriously interested in producing good work to sell at high prices this is all to the good because it puts a premium on imagination, story sense, skill in planning and posing, and other creative talents. It means that the thought, care, and hard work put into planning and executing pictures will be well repaid in preferred consideration and higher rates.

The best calendar pictures are the ones that create a mood, tell a story, or in some way appeal to the emotions. The most successful pictures are "happy" pictures. If you want to sell farm scenes, for example, look for neat, well-kept properties sparkling with fresh paint, in preference to run-down buildings, rusty and abandoned machinery, and muddy, unkempt grounds. The first will give the observer a feeling of pleasure and satisfaction; the second creates a mood of desolation and despair. The first type of picture is salable; the second is not.

Should you decide to try your hand at a picture that might serve as the illustration for a calendar for milk companies, show a healthy, rosy-cheeked child obviously enjoying a big glass of milk rather than a shot of a plaintive, undernourished child gazing hungrily at the back of a milk truck. The "happy" picture has a chance; the "sad" one hasn't. Similarly, don't submit landscapes made in the rain or show areas destroyed or damaged by flood, fire, or storm. Instead, work for bright, sunny pictures of pleasant scenes.

You can easily decide whether the mood and casting of a picture are right for the calendar people. If the scene is one that evokes pleasant sensations or the models are the type with whom you would enjoy associating, the chances are

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that the emotional impact and casting of the picture are right. As you become acquainted with the needs of the buyers you will come to learn how often seemingly small details make or break a picture. In the hope that my experience will save you from unnecessary disappointments, here are excerpts from a few rejection letters in my file:

"We liked the picture of the mother reading to her daughter from a book of fairy tales. However, the woman wore no wedding ring, thus making the picture totally useless for our purposes."

Another hard one to lose was the carefully posed picture of a milkman handing a quart of milk to a little girl standing in the doorway of her home. The expression of satisfaction and pleasure on the child's face was the result of more than an hour of coaching. The bottle was shown to good advantage and was held at just the right angle to hide the name of the dairy. The milkman was clean-cut, handsome (but not too much so), and thoroughly in character. Yet the transparency came back with the following bad news: "Everything seems as it should be but for the man's uniform. The knees are baggy and the sleeves are badly wrinkled. This may be true to life, but it just won't do for a calendar."

There are others, but you get the idea. All too often it's just such little things that make the difference between success and failure in producing salable color transparencies. So think and plan carefully before you trip the shutter. Make rough pencil sketches; they will help you to work out the best arrangements of the elements in your pictures. Once you have the picture set up, check and recheck all details. These preliminaries will help improve your pictures and raise your sale score.

Here are some specific suggestions that may help you to avoid some of the mistakes that others have made; they come directly from the calendar publishers. Don't try to compose for the full frame. Allow enough room around the sides to permit cropping. Calendar buyers seem to have a preference for horizontal compositions, but this is by no means uni-

A Cross-Section of the Calendar Market

George L. Allegar, Frank Spikins Company, DeWitt, Iowa; F. J. Back, Red Wing Advertising Company, Inc., 202-208 Main St., Red Wing, Minn.; Harold D. Cunningham, Skinner & Kennedy Co., 414 N. 4th St., St. Louis; John E. Goes, Goes Lithographing Co., 42 W. 61st St., Chicago 21; C. J. Matysik, Louis F. Dow Company, 2242 University Ave., St. Paul 14, Minn.; George L. L. McGinley, Ketterlinus Litho Mfg. Company, Primos, Pa.; John W. Newbern, Nationwide Advertising Specialty Company, Arlington, Tex.; Collins M. Shaw, Scioto Sign Service, 300 Vine St., Kenton, Ohio; E. S. Smith, Milprint Incorporated, 4200 N. Holton St., Milwaukee; R. W. Thompson, The Sale Lithographing Company, 220-224 Washington St., Buffalo 3, N. Y.

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versal. Some subjects—landscapes, for example—are natural horizontal compositions. However, if there is doubt, allow enough around the edges to permit either a vertical or a horizontal format.

Make the images as big as possible on the film. Be sure the transparency is sharp and correctly exposed.

Do not submit "ordinary" pictures. Look for the unusual. When you find a good scenic subject, take pictures at different times of day, under varying lighting conditions. Very often a subject that does not quite come off in the summer will make an outstanding winter scene.

If your picture contains identifiable people, have them sign model releases. Calendars are considered as advertising, hence model releases are needed.

When in doubt as to whether to include a figure in the scene, take it both ways but from different viewpoints. If they're good, they may both be salable to different companies.

Should people or animals be an important part of your picture, be sure that they face the camera. Select your models carefully to conform to popular conceptions of how certain types should look. All policemen are not chubby, pink-faced, and jovial, but that's how they are usually pictured. If you attempt to depart too far from this popular conception in your own model casting, your picture sales may suffer. In this, as in all selling, you'll do best in the long run if you try to give the customer what he wants.

Speaking generally, it may be said that any sized transparency from 35-mm right on up to 8x10 will sell provided it fulfills the buyer's needs and reaches him at a time when he is in the mood to buy. However, if you are sincerely interested in doing business with calendar houses on a continuing and regular basis, you'll find that your chances increase with the size of the transparencies you submit. As a general proposition, you may well decide on 2¼x2¼ as the minimum and 4x5 as the practical maximum size.

Since the transparencies you submit will be judged (and paid for) on a purely professional basis, you will want them to have the advantage of professional presentation. Most experienced workers mount their 2¼x2¼, 2¼x3¼, and 3¼x4¼ transparencies in 4x5 black cardboard masks with suitable die-cut openings. You can print your name and picture identification with white ink or pencil on the black mount. For protection against mechanical damage the mount should be placed in a 4x5 acetate sleeve. Your 4x5 transparencies may be mounted the same way using a 5x7 mount and sleeve.

A strong cardboard box makes an ideal shipping container. Always be sure to include a return-address label and return postage. Thanks to new postal regulations you may now put a letter inside a package without subjecting the whole thing to first-class postage. Just mark the words "Letter Inside" on the wrapper. You will be charged the regular fourth-class rate for the package plus three cents for the letter.

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will you make yourself known and, in turn, get to know the preferences of the publishing houses. As you begin to make sales you will automatically become selective, submitting certain types of transparencies to particular markets. The important thing is to keep at it until you become established. As buyers get to know you and to feel that they can depend on you, you will find that sales come faster and easier. Some buyers may even give you assignments for pictures they believe you are particularly qualified to produce.

If you don't expect miracles in the beginning and are willing to keep at it, with ability and intelligence, you'll be selling before you know it.—

2 New Films

(*Continued from page* 50)

now being carried on by this magazine indicate that this new film will permit pushing to ASA 64. From the findings, there is a hint that this film may be the answer to the demands by many available-light photographers for an emulsion that could be used under most tungsten-light situations. (POPULAR PHOTOGRAPHY is conducting exhaustive tests on this film and will give a full report in a future issue.)

However, this 35-mm emulsion is being sold only in 100-foot rolls, requiring photographers to load their own cassettes. In spite of the added loading chore, the great amount of saving encountered in buying film in bulk form will probably make the film a sought-after item. The film can be purchased from any authorized Ansco dealer. The price is $40 for a 100-foot roll. A group such as a camera club could pool money and buy a roll and thus cut down the per-capita investment.

Photographer Shelly Grossman was as-

KODACHROME PROFESSIONAL FILM, TYPE A, NOW AVAILABLE

The Eastman Kodak Company has announced that 35-mm Kodachrome Professional Film, Type A, is now available. The film has the same exposure indexes, filter data, and characteristics (balanced for 3400 K) as 35-mm Kodachrome, Type A, which has been off the market for more than a year. Like the previous Kodachrome, Type A, the ratings are tungsten, ASA 16, and daylight, ASA 10.

The film is available in 36-exposure loads only, and is sold without a processing charge. Local dealers can handle processing details for photographers by sending the film to laboratories of the customer's preference. The price of the film (without processing) is $2.60.

However, Eastman Kodak will offer a processing and mounting service for this film through authorized Kodak dealers. Charge for this service ($2.50) will be separate from the original purchase price of the film.

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*See article by Mr. Lavelle in this issue

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signed by POPULAR PHOTOGRAPHY to test the Anscochrome 3200 K sheet film. Grossman chose a situation that would put the film to a full test: he set up three lights in his studio (a 3,000-watt mainlight, a 2,000-watt light aimed at the background, and a 1,000-watt fill-in light) and tried shooting a dancer in action.

Rating the film at ASA 125, Grossman was able to use a shutter speed of 1/295 second and aperture of f/4.5 on his 4 x 5 Graflex camera. In the final results, dancer Fleur Raup was caught in a leap with a minimum of motion.

"It's impossible to do this with any other film," said photographer Grossman, "and what is also remarkable is that there is very little shift in color balance when the film is forced in processing."

Prices for various sizes of the film (boxes of 10 sheets each) are: 2¼ x 3¼, $3.95; 3¼ x 4¼, $5.63; 4 x 5, $7.69; 5 x 8, $11.77; and 8 x 10, $26.30.—▶

Bert Stern's Approach to Color

(*Continued from page 66*)

the negative. For his advertising pictures, particularly, he finds the square format convenient.

Another hallmark of his style is the way he uses light. "I almost never shoot in direct sunlight," he says. "Photographically it's too harsh, too unpleasant. I prefer to shoot in shade or when the sun is very low." Even with color film (he uses Anscochrome almost exclusively) he doesn't hesitate to shoot in dim light. Twilight on the beach provided the gentle, muted illumination for some of his best pictures, including the full-page color portrait on page 65.

Stern maintains an airy, high-ceilinged studio in Manhattan with large skylight windows which he uses for much of his indoor work. Sometimes he darkens most of the studio and adjusts the louvers of the window blind until a single, directional beam of daylight falls on the subject. The Hildegarde Neff portrait, with its dramatic modeling, and the low-key Gwen Verdon portrait, mentioned above, were taken by this method.

Of course, Stern does use floods and spots when the need arises, although he may bounce the light off a white background to illuminate the subject with a soft halo of backlight rather than follow a more conventional keylight-plus-fill arrangement. Flare and lack of shadow detail don't bother him if the result is visually exciting.

Although he owns an electronic-flash unit and feels it's a wonderful tool in its place, as yet he hasn't done much with speedlight. His reluctance to use it stems in part from a fear of its artificiality.

Stern's flair for design and love of strong graphic effects is especially evident in the way he handles backgrounds. Glance through his pictures and you'll see in most cases backgrounds are nonexistent. "They just are not needed unless they're a story-telling part of the picture," he says.

Instead, he works for massive effects

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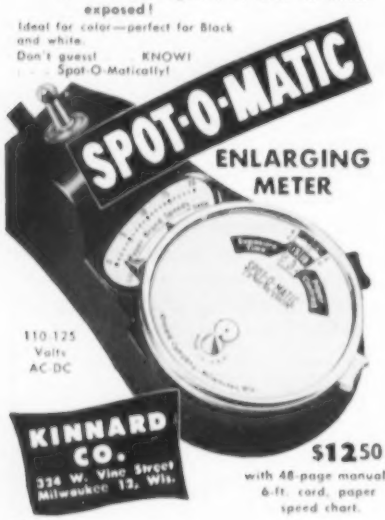

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and interesting shapes played boldly against bare space. In the studio he achieves this by blanking out background details with strong light and deliberate overexposure or, conversely, by exploiting dark shadows and underexposure. (The Eartha Kitt picture is a striking example of the former, the Gwen Verdon portrait of the latter.) Outdoors, his favorite location is the beach. "It's an ideal studio," he says. "The background of sky or sea or sand is so uncluttered and easy to use."

Stern's working methods are tentative, experimental, and simple considering the remarkable effects he sometimes achieves. It was only a few years ago, in fact, that he began fooling around with a borrowed 35-mm camera and discovered that he liked taking pictures better than laying them out in *Look's* art department, where he worked as an assistant artist and layout man. He retained his amateur status during an interlude as a free-lance designer and a stint on *Flair*. After that spectacular and ill-starred magazine folded, the Korean fighting put a temporary halt to his career. In the Army he wangled an assignment to photography school and served a hitch in Japan with a movie unit.

Success came with breathtaking suddenness after his discharge from the Army. An art director he knew, now with an advertising agency, casually suggested that Stern try his hand at shooting a picture for a new account who wanted "something different." For this, his first professional photographic assignment, Stern received enough advance to buy a car and finance a trip to New Mexico's White Sands Desert, where he shot the first of his now famous Smirnoff Vodka ads.

The imaginative, surrealistic humor of these pictures catapulted him from relative obscurity to the big time. The series has kept the Smirnoff people happy, magazine readers amused and Vodka-conscious, and Stern busy for going on three years. But although he sometimes goes to fantastic lengths to achieve authenticity (the most extreme case a trip to Egypt so he could show an out-of-focus pyramid in the background) Stern retains an amateur's freshness in the matter of technique. He candidly admits his lack of concern for technical problems. He learned by his mistakes as he went along and feels that he was willing to tackle "impossible" pictures because he didn't know they were impossible.

Although Stern has achieved a measure of personal style in the way he sees and photographs, if he has his way he won't be pinned down to a fixed approach or an expected manner. In all his photographs, whether the subject is a pretty girl or a Vodka martini, he believes "there's danger in being a fad, if it's based on something superficial or unsound." He cocks a hopeful eye on the future and remains, in his enthusiasm for the fun and excitement of photography, an amateur at heart. Perhaps that enthusiasm and his refusal to be bound by the accepted is the big reason Bert Stern has come so far so fast.—

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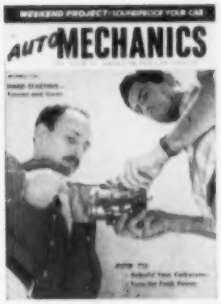

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A new 1956 edition in English of Lorelle's "Color Book of Photography" has just been published. This work covers the essentials of color photography with over 200 pages of text, dozens of easy-to understand drawings and diagrams to explain technical points, and 12 illustrations in full color. Neatly bound in cloth boards, it sells for $2.00 and will be mailed direct from City Sale & Exchange Limited, of 64 Cheapside, London E. C. 2.

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Wallace Heaton Limited, of 127 New Bond Street, London W. 1, now have the new improved Zodel "Precise" Rangefinder, calibrated in feet from 2½ feet to infinity and designed to fit the standard shoe on top of camera. The price, including plastic case, is $3.50, including

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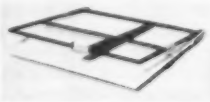

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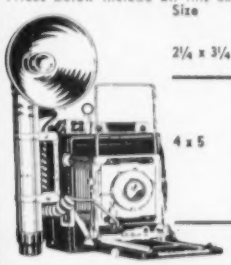
The incomparable new 1956 *Leica* M-3

Leica M-3 w/ Elmar coated f/3.5 lens	$354.00 Cash or	$35.40 Down
Leica M-3 w/ Summicron coated f/2.0 lens	447.00 Cash or	44.70 Down
Leica M-3 w/ Summarit coated f/1.5 lens	Cash or	Down
Leica M-3 Body without lens	288.00 Cash or	28.80 Down
LEICA M-3 ACCESSORIES		
Summaron-M coated 35mm f/3.5 lens	$105.00 Cash or	$10.50 Down
Elmar-M coated 90mm f/4.0 lens (standard mt.)	99.00 Cash or	9.90 Down
Elmar-M coated 90mm f/4.0 lens (collapsible)	156.00 Cash or	15.60 Down
Hektor-M coated 135mm f/4.5 lens	141.00 Cash or	14.10 Down
Leica Meter-M	30.00 Cash or	3.00 Down
Adapter, standard Leica lenses to M-3	10.50 Cash or	1.05 Down
OTHER SUPERB NEW LEICA PRODUCTS		
Stemar (Leica Stereo), complete	$297.00 Cash or	$29.70 Down
Valoy II Enlarger	96.00 Cash or	9.60 Down
Leica IIf with Elmar coated f/3.5 lens	178.50 Cash or	17.85 Down
Leica IIf with Summaron coated f/3.5 lens	222.00 Cash or	22.20 Down
Leica IIIf with Elmar coated f/3.5 lens	238.00 Cash or	23.80 Down
Leica IIIf with Summaron coated f/3.5 lens	282.00 Cash or	28.20 Down
Leica IIIf with Summicron coated f/2.0 lens	336.00 Cash or	33.60 Down
Leica IIIf with Summarit coated f/1.5 lens	366.00 Cash or	36.60 Down

1956 *Pacemaker* GRAPHIC OUTFITS

All brand new, latest models, with factory guarantee! Includes Graflok back • Ektalite screen • new Graphic coupled rangefinder with Rangelite and automatic parallax viewfinder • new full image wire finder • Graflite 3 cell flash gun • deluxe case • film pack adapter or roll film holder • 6 cut film holders • adapter ring • sunshade • 4 filters. Prices below include all this extra equipment! Easy payments available!



Size	Coated Lens in Shutter	Speed Graphic	Crown Graphic
2¼ x 3¼	101mm Ektar f/4.5 (1/800 sec.)	$338.	$299.
	105mm Tessar f/3.5	299.	279.
	105mm Ektar f/3.7	343.	294.
4 x 5	135mm Schneider Xenar f/4.7	299.	279.
	135mm Optar f/4.7	368.	319.
	127mm Ektar f/4.7	368.	319.
	135mm Tessar f/4.5	348.	299.
	150mm Tessar f/4.5	348.	299.
	150mm Schneider Xenar f/4.5	348.	299.
	152mm Ektar f/4.5	386.	337.
	135mm Schneider Xenar f/3.8	348.	299.
	150mm Tessar f/3.5	399.	379.
	150mm Schneider Xenotar f/2.8	499.	459.

New Graphic rangefinder is manufactured for 4 x 5 cameras only. 2¼ x 3¼ outfits are supplied with Kalart coupled rangefinder.

1956 MINOX III-S

Fabulous! Weighs 2½ ozs.; 3" long. Automatic transport takes 50-exposure film. Built-in flash; 9 speeds to 1/1000th sec.; sharp f/3.5 lens. With case and chain $139.50 Cash or $13.95 Down. Minox Electronic flash unit $82.50 Cash or $8.25 Down.

new 1956 Nikon S-2

Life-size rangefinder/viewfinder; rapid film transport; "full synch"; speeds to 1/1000th sec. With Nikkor coated f/2.0 lens $299.50 Cash or $29.95 Down; or with Nikkor coated f/1.4 lens $345.00 Cash or $34.50 Down. A real gem!

Latest 1956 CANON V

All new Canon V with Canon lens indicated: 50mm f/1.8 $325.00 Cash or $32.50 Down; 35mm f/1.8 $350.00 Cash or $35.00 Down; or 50mm f/1.2 $450.00 Cash or $45.00 Down.

New 1956 Automatic Exakta VX

With fully automatic diaphragm lens listed and Pentaprism R/F. Tessar f/2.8 $296.50 Cash or $29.65 Down; Biotar f/2.0 $392.00 Cash or $39.20 Down; or Xenon f/1.9 $398.70 Cash or $39.87 Down. FREE $139.50 Bonus—both wide angle and telephoto lens—with each VX listed!

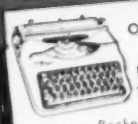
ALL NEW 1956 RETINA IIIc

Built-in exposure meter and with normal Xenon coated f/2.0 lens in M-X shutter —$190.00 Cash or $19.00 Down. Optional: Curtar 35mm coated f/5.6 wide angle lens $62.50 Cash or $6.25 Down; Longar 80mm coated f/4.0 telephoto lens $82.50 Cash or $8.25 Down. Retina IIc $139.50 Cash or $13.95 Down.

New 1956 automatic SLIDE PROJECTORS

Bell & Howell Robomatic $139.50 Cash or $13.95 Down; Revere "553" $79.50 Cash or $7.95 Down; Revere "555" $89.50 Cash or $8.95 Down; Revere "888" $144.50 Cash or $14.45 Down; Revere "888" Deluxe $159.50 Cash or $15.95 Down. Revere Models include 7 trays.

Outstanding 1956 PORTABLE Typewriters



Hermes Rocket (only 8 lbs.) with case $73.67 Cash or $7.36 Down; Underwood Universal with case $113.10 Cash or $11.31 Down; superb new Color Royal with case $124.75 Cash or $12.47 Down.

1956 POLAROID Land Cameras

Highlander Camera only $69.95 Cash or $6.95 Down. Complete Highlander outfit: camera, flash, meter, case for outfit and 3 rolls of film only $97.50 Cash or $9.75 Down! Speedliner $89.75 Cash or $8.97 Down; New 700 $125. Cash or $12.50 Down.

1956 2¼ x 2¼ Single Lens Reflex Cameras!

Hasselblad 1000F with Ektar coated f/2.8 lens $379.00 Cash or $37.90 Down; Hasselblad Superwide with Biogon Coated f/4.5 lens $489.50 Cash or $48.95 Down. Exakta 66 with Tessar Coated f/2.8 lens $319.50 Cash or $31.95 Down.

NEW Models 1956 Rolleis

Rolleicord V with Xenar f/3.5 lens $134.55 Cash or $13.45 Down. Rolleiflex with Xenar f/3.5 lens $217.50 Cash or $21.75 Down; or with Tessar f/3.5 lens $232.50 Cash or $23.25 Down. New Rolleiflex 2.8D with Xenotar or Planar f/2.8 lens $291.50 Cash or $29.15 Down.

Top 1956 16mm Equipment!

B & H 70-DR TTH f/1.9 $385.50 Cash or $38.55 Down; Revere 100' 16mm turret camera (model C-103), f/1.9 $194.50 Cash or $19.45 Down; or f/1.5 lens $252.50 Cash or $25.25 Down; Cine-Kodak Special II, Ektar f/1.4 $1280.00 Cash or $128.00 Down.

1956 KODAK Brownie Movie Outfits

Complete outfits with latest Brownie camera and projector. With single lens (f/2.7) camera $91.25 Cash or $9.12 Down; or (f/1.9) camera $106.50 Cash or $10.65 Down; or turret (f/1.9) camera with wide angle and telephoto $141.50 Cash or $14.15 Down.

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Hitch your wagon to the star! . . .

1956 CONTAX II-A and III-A

ZEISS IKON

Single-window for rangefinder and viewfinder, metal focal plane shutter, removable back, bayonet lens mount, delayed action release, full built-in flash synchronization are just a few of the reasons for the acknowledged leadership of CONTAX. Contax II-A with Tessar coated f/3.5 lens **$247. Cash or $24.70 Down**; with Sonnar coated f/2.0 lens **$298. Cash or $29.80 Down**; or with Sonnar coated f/1.5 lens **$318. Cash or $31.80 Down**. For Contax III-A (with built-in exposure meter) add **$30. Cash or $3.00 Down**.

Selected Contax Lenses and Accessories

Biogon 21mm f/4.5	$199.00 Cash or $19.90 Down
Biogon 35mm f/2.8	166.00 Cash or 16.60 Down
Planar 35mm f/3.5	102.00 Cash or 10.20 Down
Triotar 85mm f/4.0	106.00 Cash or 10.60 Down
Sonnar 85mm f/2.0	189.00 Cash or 18.90 Down
Sonnar 135mm f/4.0	146.00 Cash or 14.60 Down
Stereotar C, 35mm f/3.5's	125.00 Cash or 12.50 Down
Stereo Prism Attachment	39.00 Cash or 3.90 Down
Stereo Viewfinder	10.00 Cash or 1.00 Down

1956 IKOFLEX Ikoflex Ib with Novar coated f/3.5 lens in Prontor SVS shutter **$99. Cash or $9.90 Down**; Ikoflex Ib with Tessar coated f/3.5 lens in Prontor SVS shutter **$119. Cash or $11.90 Down**; Ikoflex Ic with coated Tessar f/3.5 lens in Prontor SVS shutter and built-in exposure meter **$146. Cash or $14.60 Down**.

1956 CONTAFLEX The gem of all 35mm Single Lens Reflex cameras! Ground-glass eye-level focusing is combined with split-image rangefinder. Superb Tessar 45mm coated f/2.8 lens, with fully automatic diaphragm. Contaflex I **$149. Cash or $14.90 Down**; Contaflex II (Built-in meter) **$179. Cash or $17.90 Down**.

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new 1956 Diax IIb

The low priced 35mm PRECISION Camera with COUPLED Rangefinder and INTERCHANGEABLE coated Lenses by SCHNEIDER, Germany!

- Handsome, modern design; rugged construction; extreme compactness.
- Equipped with high-quality SYNCHRO-COMPUR MX fully synchronized shutter with Bulb, Time and speeds from 1 sec. to 1/500th sec. Built-in self-timer.
- Rapid-wind.
- Viewfinder for 85mm/90mm lenses built-in.
- Full line of available accessories.

DIAX IIb with Isconar 50mm f/3.5 lens	$99.50 Cash or $9.95 Down
DIAX IIb with Xenar 50mm f/2.8 lens	139.50 Cash or 13.95 Down
DIAX IIb with Xenon 50mm f/2.0 lens	169.50 Cash or 16.95 Down

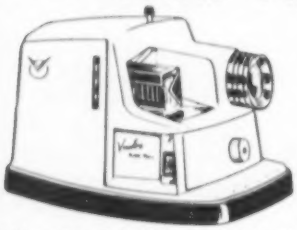
Accessory Lenses for DIAX IIb

Xenagon 35mm f/3.5 (wide angle)	$79.50 Cash or $7.95 Down
Isconar 85mm f/4.5 (telephoto)	59.50 Cash or 5.95 Down
Tele-Xenar 90mm f/3.5 (telephoto)	89.50 Cash or 8.95 Down
Tele-Xenar 135mm f/4.0 (telephoto)	109.50 Cash or 10.95 Down

FREE illustrated DIAX IIb brochure on request, or place your order **today** directly with DOWLING'S Fifth Avenue for immediate shipment!

Project-O-Matic

BY VIEWLEX
Fabulous Automatic
35mm PROJECTOR



D.F.A. proudly presents the new VIEWLEX 300 watt PROJECT-O-MATIC . . . it's in a class by itself for beauty, for efficiency, for value . . . featuring VIEWLEX's renowned brilliance and coolness.

Self-contained built-in automatic slide changer. 2 x 2 slides, in any type mount, are automatically projected forward or reverse, and returned to same slot. Holds 60 slides. Quiet, efficient fan-cooling. Visual slide selector window and dozens of other luxury features.

Only $79.50 Cash or **$7.95** Down!

Complete with Slip-on Case and 6 Trays

Stop Press! Here's a D.F.A. Super-Value!

1956 Keystone 17-Unit MOVIE OUTFIT

- **Keystone Capri Camera** with normal f/2.5 lens
- Ednalite Dual Telephoto and Wide Angle Lens—giving your Capri 3-lens versatility • Ednalite Adapter • Ednalite Dual Viewfinder
- Photo-electric Exposure Meter—a famous-make, precision product
- Exposure Meter Case
- Chrome Neck Chain for exposure meter
- Your first roll of Kodachrome Film
- Gadget Bag—handsome, hand-stitched to hold camera and all of the accessories listed above
- **Keystone Magna-Scope 500 watt Movie Projector**—very latest 1956 model with unimatic control • Projector Carrying Case
- Projection Screen—30" glass-beaded to see your movies at their sparkling best
- Castle Cartoon Movie / Castle Western Movie — Thrill the kids and yourself!
- Complete 142 page, illustrated movie course—"Movie Making for the Beginner" by Herbert C. McKay, F.R.P.S.

You make a whopping SAVING at D. F. A.'s **complete** package price of only $149.50 Cash or

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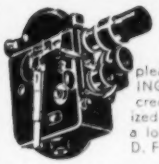

Good movie equipment is a lifetime investment. Because of D. F. A.'s Easy Payment Plan, **you** can afford to own the best **now!** You'll find it pleasant to shop by mail from DOWLING'S Fifth Avenue. Quick, confidential credit arrangements plus fast, personalized service actually may bring us "closer" to you than a local store. **Wherever** you may live, you'll find that D. F. A. means immediate service!

Bolex Paillard

Bolex C-8 with Lytar coated f/2.5 lens	$89.95 Cash or $8.95 Down
Bolex C-8 with Lytar coated f/1.9 lens	119.95 Cash or 11.99 Down
Bolex B-8 with Yvar coated f/2.5 lens	119.50 Cash or 11.95 Down
Bolex B-8 with Lytar coated f/1.9 lens	139.50 Cash or 13.95 Down
Bolex B-8 with Switar coated f/1.5 lens	197.50 Cash or 19.75 Down
Bolex H-8 Leader with Lytar coated f/1.9 lens	269.50 Cash or 26.95 Down
Bolex H-8 DeLuxe with Switar coated f/1.5 lens	438.25 Cash or 43.82 Down
Bolex H-16 Leader with Lytar coated f/1.9 lens	269.50 Cash or 26.95 Down
Bolex H-16 Supreme with Lytar c't'd f/1.9 lens	394.00 Cash or 34.90 Down
Bolex H-16 Supreme with Switar c't'd f/1.4 lens	510.00 Cash or 51.00 Down
Bolex H-16 Supreme with Switar coated f/1.4 lens, Switar 16mm coated f/1.8 lens, Switar 50mm c't'd f/1.4 lens & deluxe H-1 case, complete	824.00 Cash or 82.40 Down
Pan-Cinor Zoom coated f/2.8 lens (for 8mm)	149.50 Cash or 14.95 Down
Pan-Cinor Zoom coated f/2.8 lens (for 16mm)	349.50 Cash or 34.95 Down
Bolex Electric Camera Drive	89.50 Cash or 8.95 Down
Bolex Tripod	78.50 Cash or 7.85 Down
Bolex Titler and Special Effects Kit	299.50 Cash or 29.95 Down
Bolex M-8 Projector with case	169.50 Cash or 16.95 Down
Bolex Combination G8mm-16mm Projector	339.50 Cash or 33.95 Down

Just out! 2 superb new Pan Cinor DIRECT THROUGH-THE-LENS VIEWING zoom lenses for 16mm cameras . . . Pan Cinor-70 (17.5 to 70mm) —**$449.50 Cash or $44.95 Down**; Pan Cinor-100 (25 to 100mm)—**$750 Cash or $75 Down.**

50mm ZUNOW f/1.1

The World's Fastest Camera Lens

- Needle-sharp . . . superbly color-corrected
- 9 Elements
- Covers 46 Angle
- Focusing Range from 3.5 feet to infinity
- Click stops
- Built-in depth of field scale
- Available for Canon, Contax, Nikon, Leica f series, and Leica M-3
- Priced at $450. Cash or $45. Down!

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You can own the extraordinary new ZUNOW now. For a limited time only, DOWLING'S Fifth Avenue is offering unprecedented trade-in arrangements on the ZUNOW. Subject to our inspection . . .

Your 50mm Summicron f/2.0 plus only $250. delivers new Zunow f/1.1

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Your 50mm Nikkor f/1.4 plus only $240. delivers new Zunow f/1.1

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Just released! AMAZING new Kindermann ENLARGER for MINOX NEGATIVES . . .

- **Light, but rugged steel construction**
- **Truly portable**
- **Built-in filter**
- **Semi-automatic operation**
- **20mm Rodenstock f/2.5 lens**
- **A precision instrument for the Minox perfectionist who wants to do his own fascinating enlarging**

Including condensers, lens and bulb — **complete,** ready-to-use at the remarkable price of only **$49.50 Cash or**

$4.95 Down!

1956 KONICA II

More quality features than any camera in this price range!

- ✓ You only use a single fingertip for focusing.
- ✓ You only use one eyepiece for focusing and viewing.
- ✓ You get more shutter speeds (9 speeds to 1/500 sec.) plus full FMX synchronization.
- ✓ You get needle-sharp, ultra-fast Hexanon coated f/2.8 lens.

Only **$89.75** Cash or **$8.97** Down!

KONICA eveready case	$9.75
Autoup (20" to 40")	9.00
Sunshade	1.75

Stop press! NOW a superb 2¼ x 2¼ Twin-lens Reflex with interchangeable lenses!

TELE-KONIFLEX

Complete with normal 85mm f/3.5 Hexanon lens and 135mm f/4.5 Tele-Hexanon — both, of course, with matching viewing lenses . . .

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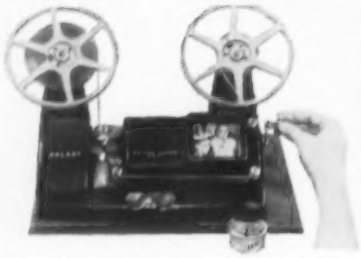

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Just released! . . . Brand new 1956 CLIPPER

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Pentron PORTABLE TAPE RECORDER

***With Exclusive* MONOMATIC* CONTROL**

MONOMATIC is a single knob control providing instant selection of Record or Play, in either 7½" or 3¾" tape speeds, as well as Fast Forward and Fast Rewind. Any position may be selected by a flick of the finger, in either tape speed.

The CLIPPER

(Don't confuse with discontinued models)

Regularly $139.50. Now, from D. F. A., only $109.50

Cash or $10.95 Down

- Plays in any position!
- Simplest to operate
- High fidelity performance
- 2-speed, 2-hour operation

DOWLING'S Fifth Avenue also features

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$189.50 Cash or $18.95 Down

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Hi-fi enthusiasts! Write D. F. A. for free brochure on Pentron low cost hi-fi tape components for portable use and custom installations!

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Top-Flight new 1956

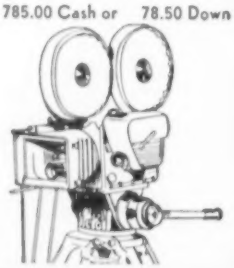
AURICON

SOUND MOVIE EQUIPMENT

"Auricon" has long been synonymous with the finest in 16mm sound motion picture equipment. In this proud tradition, D.F.A. is privileged to present these exciting, superb new models . . .

*Auricon Pro-600 (illustrated) Camera-Head	$1165.00 Cash or	$116.50 Down
Auricon Super-1200	4652.15 Cash or	465.21 Down
Auricon Filmagnetic	870.00 Cash or	87.00 Down
Auricon Cine-Voice, Single Lens Mount	695.00 Cash or	69.50 Down
Auricon Cine-Voice, Turret Lens Mount	785.00 Cash or	78.50 Down

* Please write for Auricon Pro-600 price schedule for suggested accessory combinations at special prices.



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UHLER Cine Printers

. . . the standard of perfection!

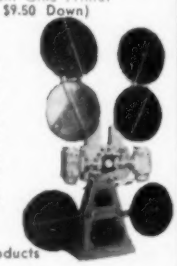
Uhler 16mm Sound Cine Printer! (illustrated)

Makes contact prints of both sound and silent pictures in black and white or color. Prints picture and sound at the same time. 400' capacity; beautiful precision finish. Copies of all your favorite films can be made at about one-quarter the cost of the original. It's easy and lots of fun to make your own prints at home. Titles may be made with double exposed motion background as shown in theatres. Complete instructions are furnished with each machine.

$125. Cash or $12.50 Down

◀ (Uhler 16mm Silent Cine Printer $95. Cash or $9.50 Down)

Uhler Combination 8mm and 16mm Continuous Printer ▶ (illustrated)



For professional or amateur movie makers, laboratories, schools and technicians—where the highest quality prints are required. Black and white or color; single or double system sound — film is run through the machine once only. 1200' capacity. Printing speed up to 1600' per hour. Lamps are air-cooled. Built-in filter holder for color film printing.

$685. Cash or $68.50 Down

Other Uhler Precision Cine Products

Combination 35mm Continuous Printer for Sound or Silent Pictures (capacity — 6-1200' feed and take-up discs)	$1145.00 Cash or	$114.50 Down
Reduction and Enlarging Printer for 8mm and 16mm (1200' capacity)	1056.88 Cash or	105.68 Down
Reduction and Enlarging Printer for 16mm and 35mm (capacity — 4-1200' feed and take-up discs)	2475.00 Cash or	247.50 Down

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NEW TRIPOD OFFERS VERSATILE ACCESSORIES

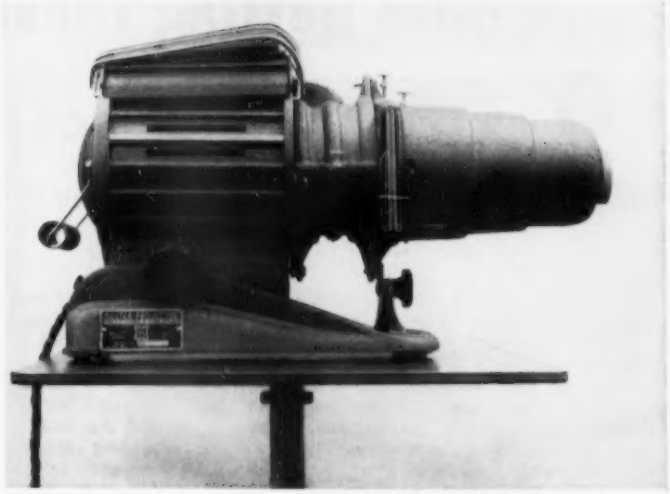


Table Top measures 12 inches by 16 inches and can support a fairly heavy slide or movie projector. When elevator column is locked, danger of slipping is slight.

IN THE old days, a tripod was a balky three-legged monster, with legs of uneven length and a way of collapsing under the weight of a Vest Pocket Kodak. Today, the new Quick-Set is designed not only as a dependable tripod but as a system of photographic supports for cameras, lights, projectors, and whatever else you may want to hold up.

The tripod, in this case, a Husky II (the equivalent of the older Quick-Set Senior) has a unique "Quick Lock" Connector on the center post. When the connector head is loosened with the wrench, (provided in the Pan Head handle) the Pan Head comes off and the accessory Gearapan (for slow pans) or Projector Table Top (to hold a movie or slide projector) can be put on.

The basic unit is, of course, the tripod and Pan Head. This model offers several improvements over the earlier Quick-Set models. The black finish is part of the metal and, according to the manufacturer, will not peel or flake off as did the crackle finish formerly used.

The leg locks have been changed so that the locking ring locks the legs by compressing a plastic bushing instead of tightening the leg section as on previous models. We found the locking action to be quick and virtually foolproof, eliminating much of the tedious manipulation necessitated by the older-type locks.

The Pan Head has been redesigned so that it clears a revolving back. On former models, it often was necessary to remove a camera from the tripod to revolve the back because the flat surface of the Pan Head would project beyond the camera body. On the new model this has been corrected.

The head has two screws, one of which locks the tilt and one the pan. Thus, the handle can be used to control either movement by loosening the proper screw, or both movements by loosening both screws. As in the older models a twist of the handle itself also will lock the Pan Head.

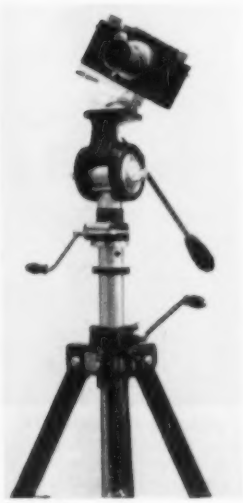
We applied considerable pressure to the elevator post by hand, much more than would be exerted by the heaviest camera, and found that the lock held and that there was very little vibration. On some tripods, the center post tightens but it can be forced down by application of pressure.

The big change is found in the little screw at the top of the center elevator post, covered by a rubber grommet. This screw controls the socket into which the various accessories are fitted. To use, the rubber grommet is slipped down and the Pan Head handle, which doubles as a wrench, is inserted into the hole to loosen the screw. The Pan Head can then be lifted out of the socket and a Gearapan or the Projector Table Top inserted.

The Gearapan is a little gadget which makes possible a smooth, slow pan with movie cameras. Turning the crank handle allows you to control not only the rate of panning movement but the amount, since there is a scale showing the number of degrees the Gearapan moves. The Pan Head can be fitted into the Gearapan, giving a sort of Rube Goldberg effect—two pans and a tilt.

The Table Top is a flat wooden platform which fits into the socket and can support a fairly heavy projector. Another handy accessory, which attaches to the tripod screw, is a Swing Top for making vertical views with miniature cameras, most of which are designed to take horizontal shots when attached to a tripod. An attachment for holding photographic lights is on the way and was not available for our inspection.

The new Quick-Set line represents the first attempt to bring to tripods the unit system now so common with cameras, creating a basic piece of equipment and making specialized accessories available to permit greater versatility. The design and construction are of high order and appear to justify the rather high prices charged. For a long-term investment, the Quick-Set seems to be a satisfactory answer to tripod problems.—



← **Swing Top** on Pan Head on Gearapan shows various accessories in use. Gearapan is most useful in movie work; Swing Top for 35-mm still cameras.

Pan Head handle is wrench to loosen socket screw to permit attaching accessories to tripod column.

Don't miss getting these 10 extra summer scenes *They will add excitement and change of pace to the footage you would normally shoot.*

By ALLAN GREEN

In the excitement of a vacation picnic or a day at the beach it is easy to forget some angles that would make the difference between a good film and an excellent one. Here we would like to list ten possible scenes that will give your films added dimension and audience appeal. By the nature of this story, these scenes are not tailor-made for your films. You must make them fit your situation.

Later on in the year you can edit these scenes into various spots in your general film. A simple splice will move a scene into any position you may desire. Therefore shoot these scenes any time you get a chance. Although they might not fit perfectly into sequences for shooting at the moment, they will fit in later on.

1 High over-all shots. Establishing shots or wide-angle views of a general scene help set the mood for following scenes. These long shots clearly tell the audience where they are and give a preview of later scenes. As an example let us examine the possibilities of an over-all shot at a typical summer carnival. The many colors, interesting people, unusual attractions, etc., all make good screen fare. For an interesting over-all shot try the following:

Mount the camera on a tripod. Then buy a ticket for the Ferris wheel. With a little manipulation the tripod can be placed securely in the seat. If you usually shoot at 24 set the indicator at 32. The faster speed makes for a much smoother effect. This shot can be used as an establishing shot for your carnival sequence. For best results do not pan or tilt the camera; let the Ferris wheel do the work. For added interest you can shoot some

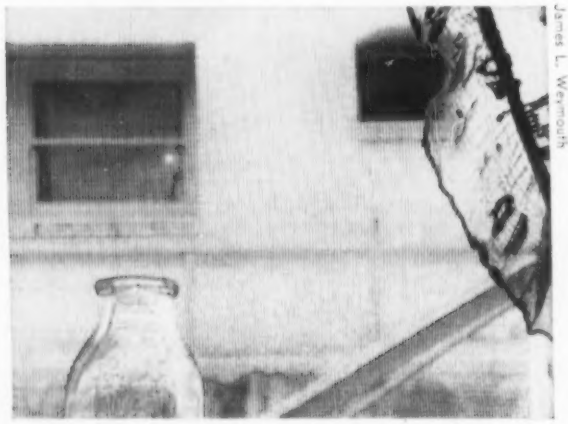
(*Continued on page* 106)

Bill Wainwright

1 High over-all shots. Such scenes help establish locale for later footage. Find high vantage point and shoot down. If area is large pan slowly across it. Use medium-yellow filter when shooting black-and-white and your haze filter for color.

Bahamas News Bureau

2 Umbrella scenes. Don't shoot all your beach scenes under the hot, bright sun. For a change of pace get some shots of subjects playing or lounging under the shade of an umbrella. Position the umbrella so it's pointing directly at the sun.



James L. Weymouth

3 Shoot through transparent objects. You can make unusual footage by shooting through screens, glass bottles, sunglasses, and other transparent materials. Since the light transmission of these objects varies, check exposures carefully.

Courtesy Rockaways' Playland

4 Take advantage of candid shots. There are many good devices for getting interesting candid shots. Mount 45-degree-angle mirror in front of lens and viewfinder and shoot into mirror, or stand behind trees, walls, or other people.

Standard Oil Co. (N.J.)

5 Travel shots. If you're going to do some summer traveling plan to take part of your footage while on your way—in terminals, from cars, trains, and other vehicles. Use a tripod, especially when shooting from a vehicle that's moving.

John H. Campbell

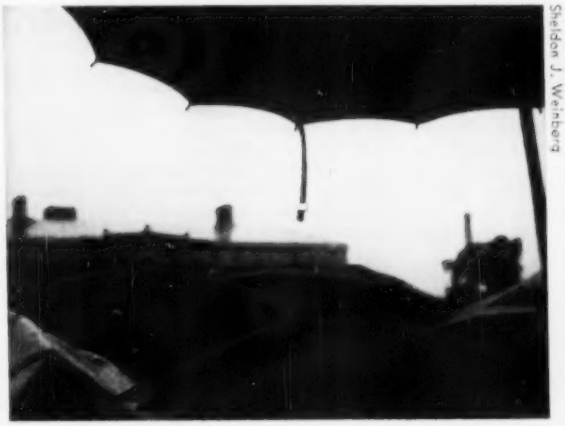
6 Fireworks. Displays of this type demand the use of color film to capture the brilliant hues. Mount camera firmly on a tripod, use a lens of long focal length, focus at infinity, and then open the diaphragm all the way, or vary fps speed.

Jacqueline Paul Roberts

7 Close-ups. Don't be afraid to film your children, family and friends close-up. These shots, carefully edited, provide interesting footage for biographical movies. Low-angle shots taken against sky provide best background.

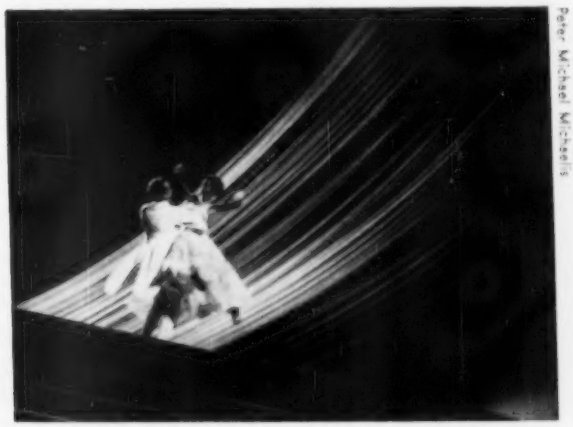
Dennis Hallinan

8 Summer action. Sports are feature attractions of summer action movies. Water skiing, swimming and diving, baseball, golf, can be shot at either fast or slow motion. The slower the motion the more exposure needed.



Sheldon J. Weinberg

9 Bad weather shooting. If you run into bad weather during your summertime fun, take advantage of it by using the new, high-speed black-and-white or color films. The lack of sunlight should not put a halt to your movie making.



Peter Michael Michaelis

10 Planned events. Whether you're doing much traveling or staying at home, attend some of the specialized summer fare provided by local organizations, i.e. ballets, shows, concerts. These shots make exciting screen showing.

SOUND FOR AMATEURS —A ROUNDUP

With a major company offering striping service let's re-examine existing tools

By BERT SECKENDORF

ANSCO, Binghamton, New York, announces a new service for amateur and professional movie makers with the initiation of Minnesota Mining's new dry laminate magnetic film-striping service which will provide a magnetic stripe on motion-picture film for subsequent sound recording by the user.—Ansco release.

With Ansco's announcement of a new film-striping service and rumors in the industry that manufacturers are planning new sound equipment for amateurs it is time to review existing sound equipment that the amateur can use.

Basically, sound is available to the motion-picture maker in two systems, one optical and the other magnetic. From the practical standpoint of costs and ease of operation, however, the *magnetic system* is the only one feasible to the amateur. A magnetic sound track can be added to a 100-foot film for as little as two or three dollars, while an optical track will cost anywhere from $20 to several hundred dollars for the same 100-foot film.

The *optical system* consists of a photographic track which is printed along one side of the film. When a light is shown through it light is translated into sound and sent through the sound system's loud speaker. The *magnetic process* consists of either a miniature tape recording which is bound to the edge of the film, or a type running on a recorder synchronized with a projector. (In this article we devote our attention to units that accept sound-striped films.) The recording and playback parts of the projector work exactly like a tape recorder; that is, the magnetized tape produces vibrations in the speaker system which are played back as sound.

Magnetic sound is usually recorded on the film while it is being projected, either by built-in recording equipment or by means of an adapter which is attached directly to the projector. It can be recorded on both 8- and 16-mm film, depending on the equipment used.

The actual process of adding magnetic sound to a film is relatively simple. The film, of course, must be sound-striped before recording can be done on it. This has to be done by a professional laboratory before exposure, after editing or at the time it is developed.

The moviemaker merely projects his striped film onto a screen, and at the same time speaks into the microphone attached to the recording head of the projector or sound adapter. The spoken dialogue is recorded automatically in perfect synchronization with the picture being shown on the screen.

By plugging a record player into the recording head instead of a microphone it is possible to add musical backgrounds or sound effects.

Here is the equipment available for making magnetic sound movies. Projectors for 16-mm film:

RCA 400 Sr., Bell & Howell 302, Ampro models 477 and 477r (playback only, no recording head). The Siemons "2000," with a 4,000-foot reel capacity, can be used to record magnetic-tape sound, optical sound, or used as a silent unit.

Projector for 8-mm film: The Calvin Company's Movie Sound 8 Recorder-Projector. Adapters for use on most 8- and 16-mm projectors: Cinesone; and the Victor Mixer Magnesound for use only to adapt Victor 16-mm optical sound projectors for use as magnetic projectors.

In addition to the "process and stripe" orders, which Ansco's Union, N. J., laboratory will handle, they will also clean and stripe older films and prints.

Ansco's new magnetic striping service marks a step forward for the amateur who wishes to make sound movies. He can now have his film striped at the same time as it is processed. This still leaves him free to edit as he sees fit, and still record his sound without having to return it to a processor for sound-striping. This results in considerable time saving.

In the past, there have been certain drawbacks with magnetic sound which newer processes have completely overcome: there was a tendency for the track to flake off, causing particles of iron oxide to be scattered over the surface of the film. The iron oxide in the stripe is an abrasive which caused a certain amount of wear in the system's recording head, and low fidelity resulted in the higher tonal ranges when being projected at speeds slower than 3½ inches per second.

For those movie makers who prefer to edit their film first, and then have it sound-striped, or want to add striping to older films, Ansco technicians have made the following recommendations:

1. Check your film to be certain that the splices are strong and clean.
2. Remove any torn perforations by cutting out the accompanying frames.
3. Clean the film with carbon tetrachloride or a commercial film cleaner to remove any dirt or grease.
4. Don't try to resurrect old, brittle, or burned film; end results will be bad.—

Technician examines film on striping machine at Union, New Jersey lab. Ansco plant offers striping service to amateurs for 8- and 16-mm film.

Check for these flaws before sending film for striping

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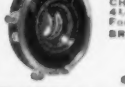

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10 Extra Summer Scenes

(*Continued from page* 102)

close-ups of the family and friends seated in the wheel and intercut this footage with the over-all shot. When using daylight color film you might try this same scene by putting a light-blue filter over the lens. Underexpose about ¼ stop to achieve a night effect.

If you are vacationing in the mountain areas, an interesting shot can be made of the surrounding countryside from a high vantage point. If you're shooting black-and-white, use a medium-yellow filter. For added effect try an orange or perhaps a deep-red filter. If you are loaded with color film use a haze filter for a clearer shot.

If you vacation in a large city, be sure to visit the highest building and make your over-all shot from that point. The same suggestions apply as in the countryside scene. For an added effect shoot toward the sun and compensate for exposure by opening the lens approximately one stop. In addition shoot a few scenes from the street.

2 Umbrella Scenes. Whether it be at lake or seashore, almost all of us have recorded waterfront activities in some manner, so let's discuss some new approaches. With fast color films on the market today we have greater latitude than ever before. Instead of shooting all your footage in bright sunlight, try a few scenes utilizing a beach umbrella. Angle the umbrella on the sand in such a manner that it faces directly into the sun. This shot is best either in early morning or late afternoon when the sun is low. Place your subject in the shade and shoot *directly* into the sun's path. Make sure you adjust your exposure for shadow areas. For an added touch try using a white towel or aluminum foil from a sandwich package as a reflector for lighting the shadows. If this is done, be sure to expose accordingly. (If you happen to be on a beach with a good pounding surf, try a few scenes at slow motion (32 FPS). If possible, the waves should be backlit with sunlight. This type of scene serves well for title backgrounds. For an interesting experiment, place a medium-blue filter over the lens. If you don't have a blue filter handy use a piece of blue cellophane. Try one take without changing the iris, and a second with the iris opened one full stop. Result: simulated night shot. Be sure to shoot this scene in bright sunlight only. Done on a hazy or cloudy day the result could be disastrous.)

3 Shoot through transparent objects. For unusual and weird effects try shooting through various transparent things. Look around and you'll discover sunglasses, soda bottles, colored windows, and other objects which can be immediately utilized for creating bizarre or humorous shots. Be sure to compensate for exposure when using these objects. Since the light transmission of each object varies, there can be no rule for determining exposure. You might take your exposure reading by placing your meter behind the object and arrive at

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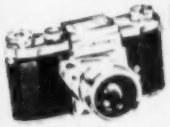

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the approximate exposure in this manner.

4 Take advantage of candid shots. Absorbing candid shots can be made by mounting a 45-degree-angle mirror in front of the lens and view-finder. The 3V Special Effects Kit discussed fully in the May 1956 issue of POPULAR PHOTOGRAPHY provides an excellent device. Your subject won't realize he's being photographed because the camera is not pointing at him. If you don't have a mirror handy, you might try the following procedure. Mount a wide-angle lens on your camera and stand at right angles to your subject. Point the lens at the subject but don't look at him through your viewfinder. This is a bit tricky, but with a little practice you can become an expert. Any other form of concealment can be used as a tree, wall, building, or other people. If you have a telephoto lens with your outfit you'll find that candid shots are easy to make without your subject realizing he's being photographed.

5 Travel Shots. If you are doing some traveling, take your movies from moving vehicles such as cars, boats, trains, etc. Shooting pictures in bus, train, or airline terminals make good transportation shots. Don't overlook the possibility of shooting from amusement rides such as a roller coaster. Remember, when shooting from moving objects, keep your camera as still as possible. Use a tripod, unipod, shoulder pod, or any other firm support which may be at hand. For added interest set the camera speed indicator at slow motion, or if you want to make the sequence more thrilling than it actually is, set the camera speed at 8 frames per second.

6 Fireworks. At almost any vacation spot there will be a fireworks display. For this subject, the use of color film is almost mandatory to capture the brilliant colors. It is advisable to mount your camera firmly. For best results use a longer focal length in order to fill the complete frame. Set the lens at infinity and open the diaphragm all the way. If you have a fast lens try a few feet at slow motion (20 frames per second). For an artistic effect place some creased cellophane in front of the lens. You can use the wrapping from a package of cigarettes. The cellophane will distort the image and should produce some interesting comments when the results are screened. For an additional effect you might also shoot the reflections of the fireworks on the water.

Later, place your friends in front of a dark or shaded background and have their faces in direct light. Then shoot a few feet of film, using a yellow filter. This procedure can be repeated with a blue filter. You can continue to place glass or cellophane of different colors over the lens. When the film is processed, intersplice the colored close-ups with the firework shots. When your results are projected it will seem as though the light from the fireworks were illuminating the family's faces.

7 Close-ups. All too many vacation movies seem to lack sufficient interest simply because the audience does not fully understand exactly what is going on. In order to correct this, make sure you include plenty of close-ups of people. Don't be afraid of getting as close as 2 or 3 feet to your subject and having him do something. For example, Junior may be enjoying an ice-cream cone. Fill the entire frame with Junior's face as he eats the ice cream. You'll find that low-angle shots against the sky or simple backgrounds are best. Close-ups can provide real biographical data in later years.

8 Summer action. There are many summer sports that are easily photographed. By all means shoot the normal scenes which you may be accustomed to, but be on the lookout for new angles to usual situations. You might include some slow-motion studies of swimming and diving, baseball, golf, etc. Remember, however, that when you are shooting slow-motion scenes the speed of your camera is increased, the exposure must be changed. If you increase from 16 frames per second to 24, open up a half stop, from 16 to 32 a full stop, and from 32 to 64, 2 stops.

9 Bad weather shooting. Now that the new high-speed color and black-and-white films are easily obtainable use them to best advantage, and be on the lookout for subjects which you would normally disregard because of inadequate light. Probably the most-ignored summer subject is bad-weather movie making. Often you'll find an unusual light in the sky just before a downpour. The sun may be shining, but off in the opposite direction the sky is turning black while the foreground area is still clear. Interesting scenes may be recorded during this period if you expose for your subject matter and disregard the dark background. During a downpour you might expose some footage showing the rain soaking the sand or hitting plants and trees. Don't overlook the possibilities of lightning in certain areas; with a little luck some really dramatic footage can be obtained.

10 Planned events. During your travels you'll find summer theaters which feature top dramatic performers. Not only are they entertaining but they provide unusual subject matter for your camera. Included in the summer theater programs are ballets, musical shows, parades, and pageants. For your best footage, concentrate on ballets and musical comedies. Many performances are held in the afternoon so that lighting is no problem. Look around for a group in rehearsal and perhaps you can shoot a few close-ups. Edit these scenes into the normal footage which you will expose during the performance.

For dramatic scenes in black-and-white use an orange filter and shoot against a clear-blue sky. Remember to compensate for exposure. If you're loaded with color, use a haze filter and underexpose one third of a stop. Be sure to use plenty of close-ups for added impact and audience appeal.

In addition to the subjects mentioned above, many others can easily be tied in with family activities. Wherever you go, whatever you do, think about your movie possibilities for a moment before wasting valuable film. If you plan and shoot carefully you'll discover an abundance of summer movie making which is sure to give you and your audience a pleasant movie evening.—

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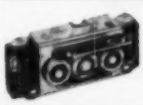

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Ricoh 35, case & flash	59.50	32.95
Robot 'Star' F:2.8 'MX' Synch.	79.00	.....
Robot Royal 36, latest F:2	325.00	196.00
Voigtlander Prominent F:1.5	270.00	133.95
Voigtlander Vitessa L, F:2.8	139.50	81.25
Voigtlander Vito IIA F:3.5	54.50	30.00
Exakta 66, Tess F:2.8	319.50	168.75
Graflex Super D 3x4, autom.	289.50	98.00
Kodak Chevron, F:3.5 Rfdr.	198.50	113.95
Kodak Medalist, Ektar F:3.5	.....	49.95
Kodak Medalist II, Ektar F:3.5	.....	99.25
Ricohflex F:3.5 ctd.	29.95	17.25
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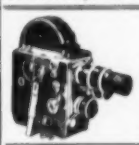

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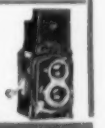

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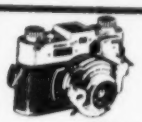

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SIZE	REG.	SALE
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For slides and movies. Beautiful, durable surface. Adjustable metal tripod legs. Metal carrying case.

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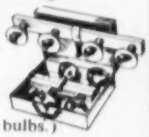

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Holds 150 glass or 300 cardboard slides. With index. Shipping weight, 4 lbs.

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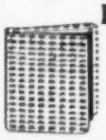

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After 60 years, here is the answer to one of photography's greatest problems: How to protect film against Scratches, Brittleness, Dust & Dirt. Now, at last, PERMAFILM does the job—effectively!
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PERMAFILM is a unique solution, easily applied by wiping on once! Film Preserver, Anti-Static Agent, Cleaner, Stabilizer—in one! When applied to emulsion side of film, PERMAFILM bonds to the gelatin, making it tougher, more resilient, and moisture protected . . . but not harder!
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1. Protects against scratches. It sets up a lasting guard against abrasion.
2. Stops warping, buckling, curling. Keeps emulsion permanently flat on its base.
3. Eliminates fingerprint nuisance.
4. Ends "popping" of slides. PERMAFILM treated slides won't warp, or fade.
5. Prevents static electricity . . . the main cause of dust and dirt.
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Rechargeable Dry Battery For Electronic Flash, Now!

New Hico-Lite Unit Uses A-C Power in Unique Circuit to Prolong Life of Special, High-Voltage Battery

Batteries are recharged by connecting power pack to a-c line. Recharging period, 4 to 8 hours, depends upon use.

WITH THE announcement of a new battery for electronic-flash use by the Olin-Mathieson Company and Hauman Instruments, makers of Hico-Lite electronic flash, at the P. A. of A. show in Chicago last July, rechargeable dry cells have become a practical reality for the flash photographer.

In the past, several manufacturers of electronic flash equipment have offered electrical devices which they claimed would depolarize and reenergize dry cell batteries, but in no case would any battery manufacturer admit the usefulness of such equipment. This is the first time a flash manufacturer and battery manufacturer have combined to offer the possibility of rechargeable dry cells.

The method uses a special circuit built into the power supplies of Hico-Lite models 109 and 228. The Hico-Lite circuit gives a 7½-second recharging cycle at 230 watt-seconds with a shorter cycle at lower powers. When recharging, the a-c cord is plugged into a power outlet. This circuit, permitting normal flash operation from either battery or a-c line, does not involve any change in the outlets, controls, or physical characteristics of the unit. It operates with a new high-voltage Olin battery containing a special battery mix which gives high voltage and a fast recycling time.

The exhaustion of a dry cell is brought about by a gradually increasing resistance within the cell, the result of chemical changes in the mix due to use and time. The electrodes become polarized and the capacity of the cell decreases. Polarization can be retarded by the application of a "counter voltage" allowing a greater portion of the ampere-hour capacity to be used. This system, developed by Hico-Lite, is called Recharge-A-Matic.

While doing experimental work on methods of retarding polarization, Hico-Lite engineers noticed that dry cells were apparently being recharged. In other words, not only was their capacity and useful life extended but it seemed that they were being renewed. Rechargeable dry batteries had been considered impossible, both from theoretical and practical points of view. A check with Olin showed that the battery mix had been refined to so high a degree that a certain amount of rechargeability was possible. Technically, this is limited rechargeability which moderately extends the useful life of the cell, rather than the complete rechargeability which is characteristic of wet storage batteries.

The amount of rechargeability is dependent upon the use of the equipment. When flashing 230 watt-seconds at one-minute intervals, followed by an eight-hour recharging period, a rechargeability factor of 4:1 was determined. In other words, the batteries can be used for four recharging cycles before battery life has deteriorated to the point where they should be discarded. Flashing 60 watt-seconds at five-minute intervals for fifty flashes followed by an eight-hour recharging period gave a 20:1 rechargeability factor.

Prices are $129.50 for the Model 109 and $199.50 for the Model 228.—

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RIVAL '35' Reflex WITH f2.8 COATED PRE-SET TESSAR LENS

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Brand New Rival Reflex with:
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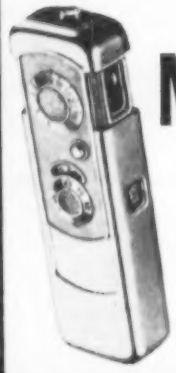

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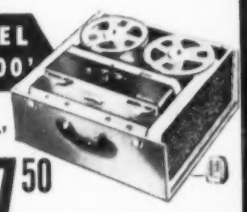

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Color Processing Without a Darkroom

(*Continued from page 55*)

hardware shop. These can be frozen in your refrigerator and then placed directly in the solutions.)

To control the temperature of wash water, a simple mixing faucet of the type shown in the illustrations on page 53 is all that is necessary. In hot weather, however—when tap water tends to reach a higher temperature than is safe for color processing—the following plan may be followed to safeguard yourself:

Place a tall graduate with a pouring lip in the sink under the tap. Tilt this graduate so that overflow from the lip will run into your tank during the washing steps. Now place ice cubes in the graduate. When water runs over the ice it will, of course, be lowered in temperature. The rate of flow of the tap water will determine how cold the water will be. Use enough ice to permit the water to completely empty and refill your tank at a rate of at least 12 times an hour. If in doubt, the faster you run the water the better.

It should be obvious that a good thermometer is essential when it comes to working with color film. By all means get one of the reliable instruments on the market, among which are the Weston Thermometer and the Kodak Process Thermometer.

Let's look a bit more closely at some aspects of the steps involved in processing color film. After you have reviewed the process by studying the picture layouts on pages 52-53 you may have questions on the following:

Agitation: Not agitating or agitating too little usually leads to results similar to those you would get if you shortened the time in the particular solution involved. In addition, poor agitation can cause streaks and uneven results.

Too much agitation is the equivalent of extra immersion time in the solution. Moreover, violent agitation may cause the film to slip from the reel.

Whatever agitating procedure you use, stick to it for predictable results.

Reversal Exposure: The length of the reversal exposure is not too critical so long as you err on the long side. In other words, extra exposure will do no harm but too little exposure will give you a weak transparency. Of course, extremely long exposure to a flood may cause heat damage to the emulsion. Placing a piece of heat-absorbing glass between lamp and film can prevent this.

Remember to rotate reels sufficiently during exposure so that both front and back of the film get adequate treatment. If your tank doesn't have a reel with a transparent end or one in which at least 50 percent of the film area is exposed you will have to strip your film from it to make the reversal exposure. Getting the film back on the reel may become quite a problem with some tanks. If yours is the push-in type you may find it easier to do this with hands and reel submerged in water. Center-loading reels are no problem and can be loaded with wet film.

ERRORS IN EKTACHROME E-2 PROCESSING

Step	Error
FIRST DEVELOPER	If solution is too warm, immersion too long, or agitation too vigorous, there is a gain in speed and shift toward magenta-blue balance.
	If solution is too cold, immersion too short, or agitation insufficient, there is a loss in speed and a shift toward yellow balance.
WASH	If omitted or unsatisfactory because of insufficient water flow, agitation and washing time, or if wash is too cold, there will be a chrome-alum scum difficult to remove.
HARDENER	Insufficient immersion leads to reticulation danger.
REVERSAL EXPOSURE	Omission results in greenish color balance, especially apparent in the shadows.
WASH	Omission results in contamination of color developer.
COLOR DEVELOPER	Omission results in clear, undeveloped film at end of processing.
	If solution is too cold or immersion too short or if agitation is insufficient, there is a shift toward greenish balance.
	If solution is too warm or if immersion is too long or if agitation is too vigorous, there is a shift toward magenta.
WASH	If wash time is too short or water is too cold, a magenta stain results.
	If wash time is too long or water is too warm a yellow-green balance results.
CLEAR	Omission results in red stain.
WASH	If wash time is too short, bleach will be contaminated in next step.
	If wash time is too long or water is too warm, there will be insufficient bleaching action in the next step.
BLEACH	If solution is too cold or if immersion is too short there will be a slight shift toward greenish balance and high density.
	Extreme length of immersion degenerates cyan dye and creates yellowish highlights.
WASH	If washing time is too short, life of fixer is shortened; if wash is omitted a drastic reduction of fixer capacity results.
FIX	If omitted, film will dry opalescent (not clear); this may be corrected by returning film to fix and repeating steps that follow.
WASH	If wash time is too short or water is too cold, a short dye life results.
STABILIZING BATH	Omission results in short dye life.

TURN PAGE FOR CORRESPONDING ANSCOCHROME CHART

It is easier and cheaper in the long run to get a modern reel with a transparent end or a new tank.

Drying: Dry your color film in a place that is cool and free from dust. Make sure that the temperature and air circulation remain reasonably constant throughout the entire time it takes for the film to dry since sudden changes in drying conditions can lead to uneven results and excessive curling and buckling of the film.

It is very important that you don't touch the surface of the film while it is drying. This is especially urgent when the film is partly dried since in this condition it is tacky and very likely to be imprinted with irremovable fingerprints.

Last but not least, don't try to hurry drying too much. Don't use extra heat, rapid-drying fluids, or alcohol unless you want to destroy in a few moments the results of one and a half hours labor. If you are used to the speed with which black-and-white film dries, remember that color films have three or more layers of emulsion, not just one.

Keeping qualities of solutions: If you must store color developing solutions limit the time to two weeks. First and color developers should not be stored for more than a week. The bleach, incidentally, is very corrosive and should never be stored in a metal container even if made of stainless steel.

Judging and Viewing Results: Until you have had the experience of developing several rolls of color film, reserve judgment as to success or failure until the film is thoroughly dry. In Ektachrome film the transparencies will appear somewhat

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K-135 (36) Stereo, 28 pairs mounted 2.80

ANSCOCHROME
35 mm. (20 Exp.) 120, 620, 828 ..... 90c

EKTACHROME
20 Exp. (E2) 35 mm. Notched and numbered 1.00

EKTACHROME
120, 620, 828 ..... 90c

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EKTACHROME ASA 32 and ANSCOCHROME ASA 32
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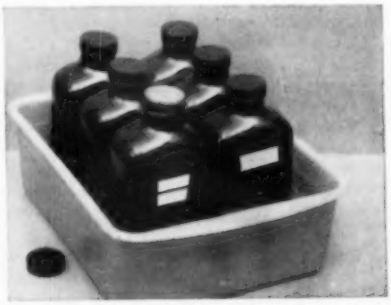
ERRORS IN ANSCOCHROME PROCESSING

Step	Error
FIRST DEVELOPER	If solution is too warm or immersion is too long, there is a gain in speed, a shift to yellow, and possible physical damage.
	If solution is too cold or immersion is too short or if agitation is insufficient, there is a loss in speed and a shift toward bluish balance.
STOP BATH	Omission results in white chromium hydroxide scumming in hardener step.
	If immersion is too long, physical damage may result.
HARDENER	Omission may result in reticulation or frilling.
	If immersion is too long there is a shift towards red.
	Insufficient agitation may result in scumming.
WASH	Omission results in contamination and scumming in subsequent color development; some color shift also likely.
REVERSAL EXPOSURE	Omission results in brownish balance, poor color saturation, low maximum density.
	If exposure is too long, there may be physical damage from overheating of the film.
COLOR DEVELOPER	Omission results in clear, undeveloped film.
	If immersion is too short, agitation insufficient, or solution too cold, there is low color saturation and a shift toward greenish.
	If immersion is too long or solution is too warm, there is a higher color saturation, slight magenta shift, and possibility of physical damage.
STOP BATH	Omission results in scumming in hardener step.
	If immersion in bath is too long there may be physical damage.
HARDENER	Omission results in reticulation and frilling.
	Lack of agitation may result in scumming.
WASH	Omission results in a magenta stain most apparent in highlights.
BLEACH	If immersion is too short or if omitted, there will be a retention of silver, denseness, and a greenish-yellow shift.
	If immersion is too long there is some loss of cyan dye.
WASH	If washing time is too short or if step is omitted, a cyan dye loss may result.
FIXER	Omission of step or too short fixing time results in opalescence and eventual dye destruction. May be corrected by refixing as soon as possible.
	Overly-long fixing time is not critical but when extremely long there is some shift to green balance.

opaque and excessively warm until the film is dry. This will disappear. In Anscochrome the colors are transparent while the film is still wet and results can be judged more readily at this stage. Nevertheless there is some slight change in color value when the film dries.

The viewing light you use to judge your color is important, too. Films viewed by daylight will usually appear too bluish, while looking at them by ordinary household tungsten lamps may give them too much warmth. Beware of fluorescent lamps when judging color transparencies and prints. Colors can be markedly distorted when using this source of light.

Best of all is a good viewing box like the Kodak Transparency Illuminator. The light of this source has a color temperature of approximately 4000 K, a compromise between daylight and household lamps. (A good makeshift is a 100-watt daylight mazda lamp which has an approximately similar color quality.)—▶



Water-bath for bottles of solution is best way to maintain constant temperatures. Ice is placed in bath, never in solutions themselves.

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with f/3.5 lens, disc. model **$98.50**

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CONTAX D

Contax D w/f/2.8 preset Tessar ..... **$ 98.95**
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With Schneider Xenon f/1.9 coated lens. Reg. $259.50. Sale **$99.50**

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Leica M3 with Summarit f/1.5	$477.00
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Leica M-3 Body	288.00
Leica IF body, built-in flash	70.80
Leica IIF body, built-in flash	120.00
Leica IIIF body, built-in flash self-timer	180.00
Leica IIF with f/3.5 Elmar	178.50
Leica IIIF with f/2 Summicron	336.00

	M-3	Standard
28mm Summaron f/5.6		$105.00
35mm Summaron f/3.5	102.00	105.00
Fuji 35mm f/2 W.A.		179.50
Fuji 50mm f/1.2		289.50
50mm Elmar, ctd. f/3.5	66.00	58.50
50mm Summarit, f/1.5	189.00	186.00
50mm Summicron f/2	159.00	156.00
85mm Summarex, f/1.5, Chrome		360.00
90mm Elmar f/4, Chrome	99.00	96.00
90mm Elmar f/4, Collaps. mt.	156.00	
125mm Hektor, f/2.5		147.00
135mm Hektor, Chrm., f/4.5	141.00	138.00
135mm Hektor sht. mtd.	121.50	121.50
Leica Meter	30.00	17.50
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Life-size rangefinder-viewfinder, rapid film transport and rewind, synchro selector. 1 sec. to 1/1000th sec. with f/2 lens **$299.50**
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The only 16mm camera providing through-the-lens focusing and viewing during exposure, electric motor drive. Matte box, cables **$1725.00**

11.5 Xenogon W.A. f/1.9	290.00
16mm Xenon f/1.9 lens	170.00
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150mm f/3.5 Kilar lens	119.95
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w/Tessar f/3.5 lens	$232.50
w/Xenar f/3.5 lens	217.50
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Case for 2.8D	18.00
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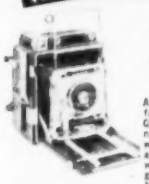
TRADE UP! A new 1956 Rollei for your MX Rollei and $66.50



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Size	Coated Lens in Shutter	Speed Graphic	Crown Graphic
	127mm Ektar f/4.7	$368	$319
	135mm Schneider Xenar f/4.7	337	291
	135mm Schneider Xenar f/3.8	388	344
	135mm Optar f/4.7	368	319
	135mm Tessar f/4.5	348	299
4 x 5	150mm Schneider Xenar f/4.5	348	299
	150mm Tessar f/4.5	348	299
	150mm Tessar f/3.5	399	379
	150mm Schneider Xenotar f/2.8	499	459
	152mm Ektar f/4.5	386	337

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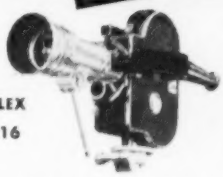
4 x 5 Pacemaker Crown Graphic with Schneider Xenar f/4.7 lens, compur full sync. shutter, coupled rangefinder. Reg. $256.70—Now only **$199.95**



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- Built in Multifocal viewfinder
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135mm Old Delft f/3.2 tele	129.00
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Designed by us for use in conjunction with closeup lenses, extension tubes, bellows attachments, to complete with a moderate investment, your closeup and copying equipment. Strong enough for a 4x5", yet compact in storage (two-piece post) and equally well suited for copying, medical, scientific work and movie titling. Camera bracket permits centering of camera over subject. 15x18" baseboard is very practical for large originals, 1½" diameter pole is 38" high. *Shipping Weight 11 lbs.*

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With C clamps, fits copy stand or enlarger pole. 2 bullet reflectors, $1.00 add'l. *Sh. Wt. 4 lbs.*

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PRO. COPY OUTFIT: Stand, light att. w. reflectors, Prox iscope Sr., all as illus. **$24.99**

EXTREME CLOSEUP LENSES

can be used with any camera—with the greatest of ease and with no extra accessories. You can get as close as 8" with a Plus 4, 7" with a Plus 5, 5½" with a Plus 6, 3½" with a Plus 10. You can use two extreme closeup lenses, with a double retaining ring, for even more extreme closeups. With a Plus 5 lens, you can fill the complete 35mm frame when reproducing a postcard; a Plus 10 lens is just right for insects, stamps and coins. Extreme Closeup lenses make macrophotography possible with a tiny investment. All exc. Plus 10, mounted in metal rings.

	Ser. V	Ser. VI	Ser. VII
Plus 4	1.75	2.00	3.25
Plus 5	1.95	2.30	3.75
Plus 6	2.25	2.75	4.25
Plus 10	2.65	3.25	5.25
Dbl. Ret. Ring	.85	.95	1.50

CLOSEUP (Portrait) LENSES

bring within every photographer's reach subjects which would be too small if photographed at the regular 3 ft. closest camera setting. Head and shoulder portraits, children's pictures, copy work—a whole new field of picture taking. All Closeup Lenses are mounted in metal rings. Deluxe lenses, made by nationally famous manufacturer, have diopter power engraved on rings.

	Reg.	Deluxe
Ser. IV		1.15
Ser. V	1.00	1.39
Ser. VI	1.25	1.59
Ser. VII	2.00	2.98

Plus 1 focuses from 39" to 20"; Plus 2 from 20" to 13", Plus 3 from 13" to 10"—for versatility, you will want set of all three Closeup Lenses. *Shpg. Chgs. 1-4—10c.*

6-PC. EXTENSION TUBE SET

for Kine Exakta, Exa. This set contains two precision-fitted brass adapters and four tubes, 5mm, 15mm, 30mm and 45mm, providing the greatest possible range of closeup work from a 3:4 reduction to a 2:2 magnification ratio. *Shipping Charge 35c.* 6 pc. set but with one FOCUSING TUBE from 40mm to 55mm, alone a $10 value. Complete set $11.50.

$7.95

4-PC. EXTENSION TUBE SET

for Praktica, Praktiflex FX, Contax, S, D, DA, Pentacon

This exceptionally well-made set includes in addition to the usual 5mm, 15mm and 30mm tubes a 45mm tube, thus permitting up to 2X magnification, when the complete set is used: a tiny object, ½" x ¾" can be made to fill the entire 35mm negative or transparency! *Shipping Charge 35c.* 4 pc. set, but with one FOCUSING TUBE, alone a $10.00 value, increasing maximum extension to 100mm.

$6.95 $9.95

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WITH ELEVATING ACTION $4.95

An absolute must for any kind of closeup and copy work. Doubles up as perfect elevating attachment, with both tripod and camera fittings for horizontal as well as vertical fastening of camera.

- A deluxe version of the most useful camera accessory for every practical photographer.
- Permits minute adjustments in a 4½" range on its geared track, with a positive lock at any desired point.

Shpg. Chg. 35c

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$14.95 Available for Leica, Canon, Kine Exakta, Exa, Praktica, Praktiflex FX, Contax S, D, DA, II (a), III (a), Pentacon, Nikon

The most useful of lens-to-camera closeup accessories. It weighs only 5 oz.; has fine leather bellows and a geared track with a positive lock. A sturdy accurate frame assures proper alignment. An extension range up to 5" is provided, with magnification factors engraved on the track. *Shpg. Chge. 45c.*

FREE with FOLDING BELLOWSCOPE: PROXISCOPE JR. a $4.00 value.

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FOR EXAKTA, LEICA, RETINA, PONY AND OTHERS

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Employs super-imposed image system for rapid, accurate focusing from 2 feet to infinity! All-metal construction, leather covering, modern styling. In feet and meters. FREE: PLASTIC STORAGE CASE. *Shpg. Chg. 10c*

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HIGHEST QUALITY OPTICAL GLASS

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Red, Green, Yellow, 089, 85C, Skylight Filters; Screw-in Lensheads

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For ANSCOCHROME, KODACHROME, EKTACHROME TYPE B: 85C, 82A, 82B, 82C.

Coated		Uncoated	
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Neutral Density 2X, 4X, 8X, 10X, Haze, #2A, 03, 050, 01, 81B, Flash 10, 20, UV-17, Infrared, CC-M10, 05A, #10.

About Filters, Closeup and Minus Lenses" is a booklet crammed with valuable info. Send 25c, or free on request with orders of $3.00 or more. Shipping charge 1 to 4 filters 10c

FREE! With purchase of 4 or more Series IV, V, VI, or VII filters and or closeup lenses—GET A VALUABLE STORAGE CASE WORTH $1.25 and up!

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If you have a camera using, or capable of using a bellows or extension tube set, you will want to invest in Minus Lenses for the thrill of taking telephoto shots without buying a regular telephoto lens, or extreme telephoto shots, in conjunction with your telephoto lens; for example, a single Minus 4 lens makes your 135mm telephoto into a 270mm telephoto—varied combinations will produce a variety of effects. Minus Lenses improve the perspective in portraits, too, by lengthening the effective focus length. Thousands of Exakta, Praktica, Contax S and Leica, Canon owners with reflex housings find Minus Lenses most useful accessories.

Minus Lenses are mounted in Metal Rings and are sold in sets of three (of your selection) or four. Available in Minus 1, 2, 3, and 4. *Shipping Charge 10c.*

	PER 3	PER 4
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w/o Pola Screen — w/Pola Screen

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Ser. IV	1.49	3.75	—
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Ser. VI	1.98	4.75	6.99
Ser. VII	2.79	5.75	7.99

A MUST FOR PORTRAITS & LANDSCAPES! DUTO-type DIFFUSERS for all cameras

Now available in standard series sizes, to fit all filter holders! Every serious photographer wants to use these famous coated diffusion disks preferred by the world's foremost pictorial photographers for their salon shots. Ser. IV $1.54; Ser. V $1.94; Ser. VI $2.24; Ser. VII $3.34

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FAMOUS GERMAN WIDEANGLE FOR 4x5"

$15.95 *Shpg. Cost 35c* IN FAMOUS MAKE X-SYNCH SHUTTER

Covers approx. 85 degrees, and one half of the lens can be removed, converting it into telephoto double the original focus length. Commercial photographers and advanced amateurs alike have waited for just such a buy! Made by Leitmeyr, an old-time German optical manufacturer, the 105mm f:6.8 coated wideangle anastigmat is for the 4x5 press camera owner just "what the doctor ordered". The popular shutter has speeds to 1/200th, B and delayed action, and built-in flash. Lensboard for Graphic, state model. $2.00

65mm WIDEANGLE for 2¼ x 3¼ $19.49

in famous make 8 speed SV-MX shutter, to 1/300 for flash and strobe.

Another Leitmeyr-made wideangle lens, 65mm f:6.8, covers about 85 degrees on the 2¼x3¼ negative. Its symmetrical construction permits use of either half of the lens as a 130mm telephoto. Shutter is latest full synch. M-X type, with delayed action, cable release socket, alone a $20 value. Lensboard for Graphic (state model) $2.

Shipping Charge 25c

Top Grain Cowhide JUMBO PRESS BAG $15.89

16"x 11"x 6" the size bag you expected to pay $50.00 for! And made of a beautifully finished topgrain cowhide, too! No zippers—just bend cover back and everything becomes accessible. Felt-covered adjustable partition, imported hardware, long shoulder strap, attached to strap around bag for easy carrying of tripod. *Shpg. Wt. 6 lbs.*

ECONOMY SIZE, 11" x 9" x 6", same construction as above 10.49

TESTED 35mm RELIABLE

FREE 36 EXP. MICROFILE the film with the finest resolution that is so wonderful for copying, all work requiring the ultimate in detail! With your order for 100 ft. of bulkfilm or $5.50 worth of cartridges (20 or 36 exp.).

ASA 4000 ? Try the new 'miracle' ULTRASPEED film! 35mm DUPONT S-X PAN 20 exp. roll 70c

Nominally rated at ASA 300, good results are obtained at ASA 1,000 and 2,000. Popular Photography's editors report in the August issue of available light shots at ASA 4,000! S-X Pan has unusually fine grain and extreme exposure latitude— truly a film of the future!
20 exp. rol. 70c—3 for $2.00 36 exp. rol. $1.00—3 for $2.75

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#106 LEICA SUMMAR f:2, Elmar 90mm f:4, Hektor 135mm f:4.5, Minolta A, f:3.5, Canon 100mm	3.95	11.75	4.95	13.50	3.95
#107 CONTAX SONNAR f:2 & f:1.5, Exa, Exacta, Praktiflex Pentacon Tessar Pre-set f:3.5 & 2.8, Biotar f:2, Nikkor f:2	3.95	11.75	4.95	13.50	3.95
#113 KODAK SIGNET f:3.5, Kodak Bantam R.F. f:3.9, Cine-Kodak Royal Ektar f:1.9 & 2.8	2.95	8.75	3.50	9.95	2.95
#114 NIKON NIKKOR f:1.4, Nikkor 35mm W. A. f:2.5 & 3.5 (New), Nikkor 135mm f:3.5	3.95	11.75	4.95	13.50	3.95
#118 CANON f:1.8, 50mm f:1.5, 135mm	3.95	11.75	4.95	13.50	3.95
#121 IKOFLEX, Konica IIA f:2	3.95	11.75	4.95	13.50	3.95
#123 GRAPHIC "35" f:3.5 & 2.8	2.95	8.75	3.50	9.95	2.95
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#125 LEICA SUMMARIT f:1.5, Westanar 50mm f:2.8 (automatic) Westagem 50mm f:2 (automatic), Switar 50mm f:1.4	3.95	11.75	4.95	13.50	3.95
#301 ROLLEI f:3.5 Bayonet, Minolta Autocord f:3.5, Aireaflex f:3.5	3.95	11.75	14.95	X	3.95
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35-mm TODAY
by Bob Schwalberg

(*Continued from page* 28)

fluorescents and such. In any case, my tests with Isopan Ultra indicate that the 640 rating works well both in and out of doors.

The really important thing about this data sheet is that the photographer is given information that to our knowledge, at any rate, has never before appeared in a film-data sheet. He is told that the film has a certain standard rating with which the film can be depended upon to give acceptable results over a wide range of circumstances and with great tolerance for exposure errors. But he is also told, in effect, that if he's willing to exercise moderate care in using the meter to determine his exposure, he can achieve optimum results by removing the main safety factors. The choice is his.

Kodachrome Professional Film, Type A

The timely resurrection of Type A Kodachrome marks the happy end to a sad story. The anguished protests which greeted its discontinuation in favor of the flash-balanced Type F emulsion may not all have been polite, but they expressed the most sincere admiration that any product could possibly enjoy. As good as the Type F films are in performing their role with clear, wire-filled lamps, they just couldn't fill Type A's big shoes.

Many top-flight amateur and professional 35-mm photographers used Type A as a universal film, preferring its softer quality with the daylight conversion filter to that of the daylight-balanced film. Balanced at 3400 K for amateur-type photofloods (another professional stand-by, incidentally) Type A could be relied upon as an indoor available-light performer under all sorts of lighting conditions, with and without filtering. If it made a mistake, nine chances out of ten the result pleasing and usable.

A lot of us owe the people at Kodak a vote of thanks for Kodachrome Professional Film, Type A. After the letters I wrote, it's a pleasure to say mine in public. Thanks.—

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200' EK Linagraph Shellburst	Each	1.75
400' Ansco Color, Indoor	Each	48.95
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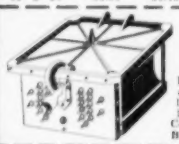

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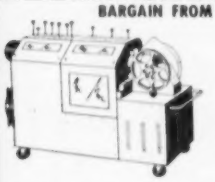

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3¼x5¼	SWG	4	500	1.00
4x6	DWG	3	144	1.00
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7½x7½	SWG	0	144	1.00
8x10	SWG	2-4	100	2.95
8x10	SWSM	4	100	2.05
8x10	SWSM	3	144	2.75
8x10½	SWSM	1	144	1.25
8x10½	LWFSM	3-4	100	1.50
8x10½	LWFSM	2-5	144	1.90
8½x11	LWFSM	2	50	1.00
10x10	SWSM	1-2-3-4	100	1.95
10x10	SWSM	3	144	2.75
10x10	SWG	1	100	2.45
10x10	SWSM	1	144	2.45
10x10	LWFSM	2-3	250	3.70
10x10	SWSM	2-3	250	3.70
11x14	LWFSM	2-3	50	2.15
16x20	SWSM	2-3	100	3.75
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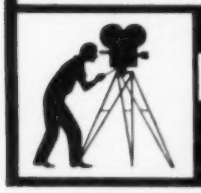

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What's Wrong With My Color?

(Continued from page 59)

High temperatures affect the film at any time. Humidity becomes important as soon as the film is removed from the sealed container in which it is packed. It's good policy to buy fresh film, use it promptly, and send it in for processing as soon as you have finished the roll. It's far better to waste a shot or two at the end of a roll than to hold the film indefinitely while waiting for an opportunity to use it.

Who keeps film too long? Maybe you shoot it up fast, but some folks really save it. We saw one roll with two Christmas trees on it—which wouldn't have been surprising except that there was a string of summer scenes and autumn leaves in between them and the film was developed in March!

Avoiding high temperatures calls for care in storing film and in handling the loaded camera. Don't leave it in a hot place like the glove compartment of a car. Your corner mail box can be a dangerous place to deposit film. If you yourself send it away for processing on a hot summer day, drop it off at the nearest post office instead of placing it in the hot metal box to cook until pick-up time. More and more film is being sold without including the cost of processing in the purchase price, which makes it easier to have it developed through your camera store instead of mailing it to the laboratory yourself.

Exposure errors

When pictures come out too dark, with colors excessively dense, the cause is underexposure. If they appear too light, with hues weak and washed-out looking, overexposure is indicated. Most of the pictures that were checked showed remarkably good exposure—when they were taken under favorable conditions. Sunny-day shots of people and scenes of average brightness usually were good. The instructions packed with color film contain the key to these results.

For Kodachrome, the basic sunny-day exposure under average conditions is 1/50 second with lens set at *f*/6.3 (halfway between *f*/5.6 and *f*/8). Evidently most fans are using it, or employing exposure meters which usually indicate about the same settings under similar conditions. When there's trouble, usually it seems to be caused by using this average exposure for scenes that aren't average.

Most underexposures showed scenes that were inherently dark. Street scenes, for example, may have been taken on bright days when *f*/6.3 and 1/50 second would be a good exposure out in the open. When they came out too dark it usually was because there just wasn't enough light striking the objects in the picture. When buildings cut off much of the light from the sky, it's better to use 1/50 second at *f*/4.5.

Overexposures usually seemed to result from using standard camera settings in scenes that were naturally very bright. Most washed-out pictures were taken at the beach in summer or on the snow in winter. Under these conditions, with light subject matter and brilliant sunshine, it's best to select an exposure of 1/50 or 1/100 second at *f*/8 or even *f*/11.

Advanced color workers, particularly those who submit slides in the exhibitions, frequently underexpose their pictures slightly. This deliberate error intensifies the colors, making them appear in deeper hues. It sometimes gives striking results, but such slides look their best only when projected with plenty of illumination so the darker areas don't all go completely black.

Dark shadows

In discussing exposure we have been talking about the camera settings to use for general scenes. Sometimes the scene itself isn't important, but is only background for the subject. Then the exposure should be based on the subject itself.

We saw many pictures of people in outdoor scenes where the scenes themselves were properly exposed. The trouble was that the subjects' faces were in shadow. Exposure meters and charts don't help much in a situation like this, unless you think while you're using them. They won't think for you. You've got to decide whether you want the sunlit portion of the scene or the shadow areas to be properly exposed, and then set your camera accordingly. When you have a chance, it's almost always better to move the subject or wait for a change in the sunlight until both subject and background receive the same amount of light. Another solution, if you don't want to move the subject, is to use a blue flashbulb fired on the camera to fill in the shadows.

Over-all blur

The most common cause of picture failure in ordinary black-and-white snapshots is over-all blur due to camera movement. We had thought that this might carry over into color slides, too, but were pleasantly surprised by the average picture sharpness. Evidently the miniature cameras used for color-slide making are easier to hold steady than box-camera outfits. Another factor probably is shutter speed. The most common setting for color shots is 1/50 second, while most fixed shutters on box cameras operate at around 1/30 second.

While there were few grossly blurred pictures, there were many that failed to reveal all the crisp detail they might have shown. There's a difference between satisfactory sharpness for average pictures and the ultimate definition sought by the advanced color worker and the enthusiastic stereo fan. To squeeze out every last bit of sharpness, of course it's best to use a tripod whenever you can and to shoot as fast as conditions will allow when using the camera hand-held.

Blur—moving subject

Most of the subjects that amateurs shoot are of the type that stays put while you trip the shutter. Once in a while there will be a blurred hand as someone waves toward the camera, but usual color exposures seem to stop incidental movements you find in still pictures. Only when the subject is really in action do you find extreme blur.

The answer, of course, is to shoot faster

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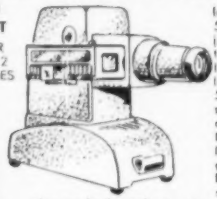

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Blur—near or far objects

When a still subject is blurred and the background is sharp, a focusing error is indicated. The slide maker's mistake is seldom a small error in focusing. He either focuses accurately enough or fails to focus at all, leaving the camera at the setting that was employed for the previous picture.

When the first shot of a series is focused correctly and subsequent ones are taken at about the same distance, everything works out all right. When you change from a distant view to a close-up, though, forgetting to focus will spoil the picture. The same thing holds true when you shift the other way. We saw a few rolls where the camera seemed to have been left at the infinity position. Distant objects always were sharp, but when there was subject matter in the foreground it was blurred.

The cameras used for 35-mm work have lenses of short focal length, capable of rendering things sharp through quite a range of distances at any one setting. Objects nearer and farther than the plane focused on appear satisfactorily sharp. This has led to "zone focusing," a system of setting the lens for certain depth areas instead of specific distances. It works very well. To sum up the focusing problem for color slides, extreme accuracy seems unnecessary under most conditions. If you remember to focus at all, and do so with reasonable care you'll have little trouble with blurred pictures on this account.

Over-all foggy appearance

Sometimes pictures lack sharpness and contrast all over, as though they were taken through a dirty window. That's probably what happened, in a way, when you stop to think of it. Dust, moisture, or oily fingermarks on lens or filter cause tl is effect. It's easy to avoid this by keeping your lens clean. Note the condition of its inside surface when you have the camera open for loading. A handkerchief, soft from many washings, is as good as anything for lens cleaning. Gently brush off surface dust before you start. A fine camel's-hair brush is good for removing dust, but it must be kept clean. If it gets oil on it, it's worse than nothing.

Irregular black marks

It pays to inspect the inside of your camera each time you load it, and to pay attention to film cartridges, too. Irregular black marks on pictures can be caused by dirt or other foreign matter that gets into the camera and comes to rest on the film when you get ready to take a picture.

At the Chicago laboratory, we saw one roll of pictures that had a black image of a piece of 35-mm film, including two perforations, on every shot. Evidently a previous roll had been torn, in some manner, and a small piece of film had gotten loose in the camera. It came to rest at the bottom of the camera's picture aperture, which made it appear at the top of each slide since the image is inverted by the lens.

Clear or reddish areas

When light strikes the film in any way except by a regular exposure through the lens, you're in for trouble. Clear or reddish areas on the film, with blurred, irregular edges, are the result. When they come at the end of the roll, improper loading is the most likely cause. The film roll or cartridge should be removed from its container in subdued light. After it has been inserted, the camera should be closed and locked before the film is advanced to bring a fresh portion of it into picture-taking position. Narrow streaks that run across the film on the first picture or two indicate that strong light has leaked in through the lips of the cartridge.

When an area of film is light-struck in the middle of a roll, it seems likely that the camera has been opened by accident while loaded. If streaks of light appear in the same pattern on several slides, there may be a light-leak in your camera. The film inspectors watch for signs of trouble like this, but they see only one roll of film at a time. You're in a much better position to catch it. Any pattern like this that repeats itself on more than one roll of film is a sure sign your camera should be inspected.

Light disks or curved streaks

Film inspectors see plenty of flying saucers, but they don't get as excited about them as amateur photographers sometimes do. Light disks or curved streaks that are segments of circles frequently appear in pictures taken with camera pointed in the direction of the sun or some other concentrated light source. They are caused by internal reflections from the surfaces of lens elements. To avoid it, shield your lens from all direct rays. A lens shade is a good accessory to use all the time. When you want to shoot almost into the sun for a backlighted effect, have someone hold a hand up out of the picture where it casts its shadow on the lens. You can do the same thing yourself with the camera on a tripod.

Over-all reddish cast

It seems that everybody gets pictures at times that reveal an over-all reddish hue. Usually you'll find long shadows in the same picture, which provides a clue to the trouble. The sun's light becomes more reddish late in the day, and color film will notice it even if you don't.

If you're particular enough, you may want to get a bluish color-correction filter to use at this time of day. Full exposure helps, even without a filter. Underexposure exaggerates the effect.

A much more disturbing redness is caused by using daylight-type film in artificial light. Blue flashbulbs are the only light source balanced exactly for this type of film, although many electronic-flash units produce very good results. Clear, wire-filled flashbulbs give pictures a red-

dish hue, gas-filled SM or SF lamps and floodlamps are redder still and ordinary tungsten house lamps are worst of all.

Over-all bluish cast

It's no accident that dull days are called blue days. When the warm, yellow rays of the sun fail to get through to our subjects, pictures take on a bluish cast. It may at times be a pretty accurate record of the way things looked, but we seldom find it acceptable. This effect can be tempered by using pinkish, color-correction filters (Skylight-type) over the camera lens.

A subject in open shade is illuminated by blue light from the sky and gets no direct, warm rays from the sun. It's no wonder that the subject's face may look blue and cold under these conditions. A Skylight filter, pinkish in hue, will serve to warm pictures taken in the cool blue shade. Some photographers like its added warmth even for normal scenes and leave it on all the time—like wearing rose-colored glasses to make everything look rosy.

If a couple of very blue pictures turn up in a roll of tungsten color film like Type A Kodachrome, it's easy to guess what happened. Chances are that they're daylight shots and the photographer forgot to put on his color-compensating filter. With it, the film is balanced for daylight; without it you get the bluest sort of day you ever saw.

Bouncing colors

We've got a pretty good idea, in our own minds, of the colors some things ought to be. Skin-color, in particular, is likely to bother us if it doesn't look natural. Yet there are times when flesh can take on different hues in perfectly normal ways. Even when we realize that they're normal, we aren't likely to be happy with the result.

Bluish faces, reddish faces, and even some greenish ones pop up in freshly processed slides. Sometimes you can see the reason, right in the picture. Again, you may have to guess at the cause unless you know what the surroundings were like when the picture was taken. These odd quirks of color usually result from light that bounces off colored surfaces and onto the face of the subject.

Suppose you pose a bathing beauty on a red beach robe with sun almost overhead. Her face will look normal in tone where direct sunlight strikes it, but watch for that area under her chin. It's shaded from the sun, but it isn't entirely dark. Chances are it's illuminated by bounce-light from the red robe, making it a reddish triangle. Substitute green grass for the red robe and you may get a triangle of green. The side of a house, an automobile, a beach umbrella, colored flagstones on a patio—there are dozens of things that can bounce colored light onto your subjects.

When you get slides back from processing, it pays to go over them while the original scenes are fresh in your mind. You can learn by studying your own pictures. If you keep at it, that pile of top-notch slides will grow and rejects diminish with every new roll.—

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Meet The New Minolta Autocord

New Japanese Reflex Camera Offers Built-In

Light Value Scale Photoelectric Exposure Meter

Somewhat overshadowed by its sporty 35-mm cousin in the German-Japanese war for the camera dollar, the twin-lens-reflex camera has remained almost strictly a German specialty. The Japanese twin-lens-reflex models have not offered enough to pose a serious threat to the well-established (and well-deserved) reputation of the German products.

However, with the arrival of the new Minolta Autocord "L", it appears that the Japanese camera industry is beginning to devote the same care and ingenuity given the miniature to the twin-lens reflex. This camera offers reflex features which are unique in the field.

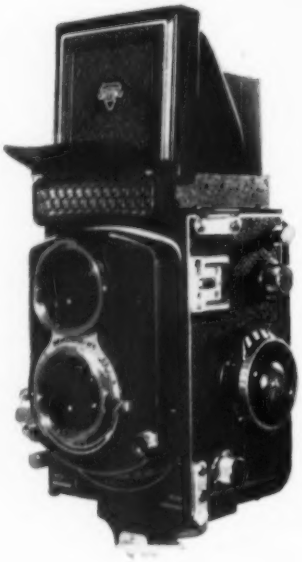
The first is a lever beneath the lens board for focusing, instead of the more familiar knob at the side, or geared lens mounts. This method may seem awkward at first, particularly if you are used to focusing knobs, but it soon becomes familiar and just about as easy to use. The left hand is used to support the camera and work the focusing lever, with the right hand operating the automatic film transport-shutter wind crank and the body release.

The second innovation, and one which distinguishes this camera from the previous model of the Minolta Autocord, is a built-in photoelectric exposure meter, calibrated in light-values, rather than the usual combination of *f*-stops and shutter speeds. The front of the shutter housing is marked with two sets of numbers, one representing shutter speeds, the other *f*-stops. The light value is taken from the meter dial and any combination of numbers from the front of the camera which equals the light value number will give correct exposure. The actual shutter speeds and lens openings are read from the peephole at the top of the viewing lens.

For example, if the needle on the meter indicates a light value of 10, setting the shutter dial to 5 and the lens dial to 5 gives an exposure of *f*/5.6 at 1/50 second. Using 6 and 4, the exposure would be *f*/4 at 1/100 second.

The third innovation is the film path. Instead of the film traveling from bottom to top as in just about every other reflex we know of, the Minolta film transport works from top to bottom. This puts the curve of the film past the film aperture and tends to keep the film flatter in the focal plane during exposure.

The film transport worked smoothly and accurately and the body release was quite gentle. The shutter has been changed to give a 1/500-second top speed but the lens remains the 75-mm Rokkor *f*/3.5 used in the older model. This lens is a four-element Tessar-type and the one in our camera was of very good quality. There is, of course, built-in flash for both electronic flash and flash bulbs. A fresnel lens gives a bright image on the groundglass.—



Photoelectric cell is mounted below hood. Dial is at side of camera and registers light-scale values. In use, values on lens mount (below) showing lens and shutter settings are added together to equal meter reading. Meter read "18" for settings shown.

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CAMERA CLEANUP

By SEBASTIAN CAPUTO

A periodic checking and cleaning job will contribute to greater efficiency and longer life for your camera and its accessories

Even with the best of care in use and handling, cameras and related equipment (lenses, filters, exposure meters, cases, and other accessories) will benefit from a thorough cleaning and check-up at intervals. Dust and other particles can accumulate practically unnoticed in cameras and cases—lenses and filters may gather tiny smudges or fingermarks; these are among the things that can impede efficient performance of your photographic equipment and affect your pictures.

The principal items necessary for a camera cleanup job are illustrated and enumerated here. In addition, some soft, clean, lintless cloth, good leather-wax, and a polishing cloth should be on hand.

First, inspect inside and outside of your camera—not overlooking such spots as the tripod socket (where dust and grime may accumulate, to detriment of threads) winding knobs, take-up spool, etc.

It's a good idea to start working on the inside of the camera so that when it is checked and cleaned you can close the camera and proceed to work on the exterior.

The function of the ear syringe is to dislodge and blow dust and grime particles out of corners and other spots not easily accessible in cameras, cases, and equipment.

With lens brush, dust camera lens carefully; then fog lens with your breath and polish very gently with lens tissue—which should be of the best quality obtainable. This procedure should be followed also for filters and, when working on outer part of camera, for rangefinder and viewfinder, as well. Examine filters closely for possible scratches or minute cracks which might necessitate replacing them.

Accurate focusing of a press-type camera can be affected if dirt collects on the track of camera bed. A firm-bristled toothbrush should be used to remove all trace of dust or grime from the track.

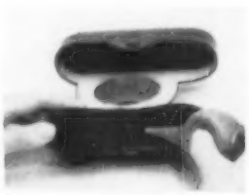
Folds and crevices of camera bellows collect a certain amount of dust; rack bellows out and clean with 1-inch brush as shown in accompanying illustration. Follow cleaning with a thin coating of leather-wax. Camera and bellows should be handled with care, always.

To check rangefinder of your press-type camera for accuracy, place the camera on a tripod, and focus on subjects placed at preset distances—say five, ten, fifteen, twenty feet, and infinity. Open back of camera and focus with rangefinder on each distance, consecutively, and check groundglass image. If image is sharp and focusing scale coincides—fine; if not, better see your camera repairman.

Wipe exposure meter with a soft, clean cloth; remove dust from baffle with syringe. If possible, check meter against one of similar make and type to make sure that it's in good working order.

After thorough cleaning of camera and equipment, a coating of wax applied to all outer leather surfaces and rubbed with polishing cloth will supply a lustrous, protective finish.—

Grouped in the photograph at top of page are the few items that are most essential for your camera cleanup—small ear syringe, lens brush, lens tissues, firm-bristled toothbrush, and 1-inch brush. At right, **1** Use syringe to blow out dust and other particles that lodge in hard-to-reach corners of cameras and equipment. **2** Dust lens carefully with lens brush. **3** After dusting, polish lens very gently with lens tissue. **4** The toothbrush is used to clean dust or grime from track of a press camera. **5** Camera bellows is racked out and all folds and crevices dusted and cleaned gently with 1-inch brush. **6** When all details of cleaning have been completed, a light coating of leather-wax, applied to leather cases and camera covering, will help to protect and preserve these surfaces, and supplies a lustrous finish.



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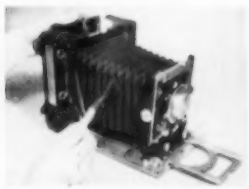

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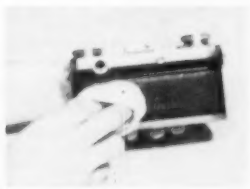

6

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With fully auto. ctd. f/2.8 Westanar

$129.50

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- Speeds 1 sec. to 1/1000 sec.
- Self-timer • Full synch.
- Auto. shutter cocking and film transport
- Prismatic eye-level finder

• FREE! Leather eveready case 100mm f/4.5 ctd. tele. lens $15.95

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35mm ROBOT STAR

w/Schneider Xenon f/1.9 ctd. lens

- Uses 35mm standard B & W or color
- Takes rapid sequence shots — 5 action shots per sec.
- 55 exposures on 36 exp. film
- Auto. film transport & shutter cocking • Full flash synch.

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Leather eveready case $10.50

• SERVICE • VALUE • RELIABILITY

- 25 years of know-how
- Penn delivers merchandise advertised at prices shown
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Inquiries given prompt attention!

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- Double safety lock back
- Takes 12 2¼" x 2¼" shots

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Complete with Sunflector, cord and bracket. A.C.

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2x2 SVE SLIDE PROJECTOR

- All metal • Blower cooled
- 5" anastigmat lens
- Tilt-elevating device
- Horizontal slide carrier

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- Light weight, precision made
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7x50	23.75
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20x50	37.50

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SAVE UP TO 50%

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Brand New! Famous Makes!

	Reg.	Sale
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Skan	15.95	7.95
Weston DR	16.95	12.75
GE PRI	35.50	24.95

FREE! Case with each meter

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Pole Tripod w/pan head	21.85	7.49

SPECTACULAR PENN OFFER!

ADD SOUND TO YOUR HOME MOVIES

- Voices • Music • Sound Effects
- Easily • At Low Cost
- Professional Quality

Complete CINESONE Sound Outfit

BRAND NEW! LATEST MODEL!

Only **$99.50**

Sold nationally at $199.75

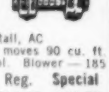
FULLY GUARANTEED

Specify 8mm or 16mm

- For 8mm or 16mm projectors using 300 ft. or larger reels • Snap recording head on to projector and you're ready to add sound as you project on any soundstriped film • Immediate playback of sound and picture • Fidelity is as good as more expensive sound outfits.

Brochure on request. You may purchase Cinesone on time payments. Write for Penn's combination price on Cinesone plus a projector of your choice.

DARK ROOM VENTILATORS



- Remove odors
- Give constant flow of fresh air
- Easy to install, AC

Single blower moves 90 cu. ft. per min., Dbl. Blower — 185 cu. ft.

	Reg.	Special
Single	$14.95	$11.50
Double	21.50	16.95

Standard Double

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Fits all Graphics and other cameras with standard press-type spring backs.

	Reg.	SPEC.
2¼x3¼	$ 3.85	$ 2.79
3¼x4¼	3.99	2.89
4x5	4.12	2.99
5x7	4.71	3.39
*8x10	13.00	10.40

Minimum Order — 3
*No Minimum Required

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Factory Sealed • 1957 Date
Specify Daylite or Indoor

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High Speed • ASA 32

	Per Roll
†35mm x 20 exp.	$1.45
35mm x 100'	31.25
*828 Bantam	.79
*120 or 620	.98

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†8mm roll (dble)	1.92
†8mm mag. (dble.)	3.93
†16mm x 100'	5.72
†16mm x 100' Sound	5.72
†16mm mag.	4.80
†35mm x 20 exp.	1.45
†35mm x 36 exp.	1.96
*828 Bantam	.79
†Bolex 8mm x 100'	5.72

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Universal for Day & Flash

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With preset diaphragms (except f/4.5)

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250mm f/5.6	124.50	62.25
Travenar 135mm f/3.5 With auto. diaphragm	99.50	59.95
Elitar Soligor 135mm f/2.8 (Please specify camera when ordering above lenses)	Special	74.50
*Elitar Soligor 135mm f/4.5 *For Argus C3, couples to RF	Special	39.95

MOVIE LENSES	MT.	LIST	SALE
6mm f/1.9†	8mm "D"	$ 39.95	$ 26.60
7mm f/2.5†	8mm "D"	19.95	13.30
1½" f/3.5	8mm "D"	15.95	10.65
1½" f/2.7	8mm "D"	29.95	19.95
1½" f/1.5	8mm "D"	42.50	28.40
1½" f/1.1	8mm "D"	89.95	59.95
1½" f/1.4	E.K. Mag. 8mm	49.95	33.30
15mm f/1.5	16mm "C"	79.95	53.30
17mm f/2.7††	16mm "C"	34.95	23.30
1" f/0.95	16mm "C"	175.00	116.65
3" f/2.5††	16mm "C"	42.50	28.40
3" f/1.9††	16mm "C"	49.95	33.00
3" f/1.5	16mm "C"	89.95	59.95

Movie lenses have click stop diaphragms and built-in filter holders.
†Fixed focus ††Without filter holder.

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- 620 roll film adapter
- For press cameras 2¼x3¼, 3¼x4¼, 4x5
- Makes 2¼x3¼ & 2¼x2¼ exposures

Special price **$23.95**

Reg. $29.95
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COMPLETE WITH MAILING BAGS . . . 20 EXP. CARTRIDGES LOADED DAILY . . . FROM 100 FT. ROLLS RECEIVED DIRECT FROM EASTMAN KODAK.

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100% SATISFACTION GUARANTEED OR MONEY BACK!

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FACTORY PACKED 1 YR. EXPIRATION

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4 ROLLS — 7.39
7 FOR — 12.59

16mm-100 FT. ROLLS
3 ROLLS — 16.59
5 FOR — 27.49

8mm 25 FT. Mag
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PLEASE ENCLOSE 15¢ FOR POSTAGE

35mm BULK FILM LOADER

with 5 free cartridges $4.99
with 100 ft. 35mm Kodak Tri-X 8.49
with 25 ft. Ansco Color 535 . . . . . 10.95
with 28 ft. Ektachrome 15.75

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4 ROLLS . . .	$1.75	4 ROLLS . .	$1.97
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How to Make Flexichrome Full Color Prints

(*Continued from page 49*)

incentive to learn this will be great, however, if only because this is a relatively untouched field with all the excitement of discovering the unknown.

Because of its long tonal range from very deep color to very light color—a characteristic that is unique among color processes—Flexichrome lends itself to a much deeper modeling of forms than can be employed in straight color photography. Other color films call for flat light, fill-ins, and a limited range of contrast generally not to exceed one to four. With cool shadows the apparent depth of a Flexichrome print becomes astonishingly lifelike and three-dimensional. On one of my Flexichrome prints a large drop of water on a lotus leaf is so realistically depicted that one observer at an exhibition asked, "How is the water drop held in place?"

For precise details on many of the features and possibilities of the Flexichrome process, Kodak's data book on Flexichrome is invaluable. You can buy it at your dealers for 75 cents. All the materials necessary for making Flexichrome prints are available at your dealer's too. Besides these materials and your normal darkroom equipment you'll need lots of hot water.

Because Flexichrome is a hand-coloring single-picture process, you will quite naturally be somewhat limited in your ability to make duplicates. If more than one print is desired, it is most practical to make the required number of matrices at the same time, when the proper exposure has been determined. Then, after one matrix has been colored as desired, it can act as a guide for the others and help to speed the operation. Another duplicating method is to take a completed, colored matrix and squeegee it to a prepared sheet of dye-transfer paper for a sufficient amount of time to allow a transposition of colors. In this way you can recolor the matrix a number of times and continue to make copies.

For your first Flexichrome project it is important to remember that the more detail in your picture, the longer it will take to color it. For this reason, it is recommended that you start with a fairly simple photograph.

For me the most important thing about Flexichrome is the opportunity it offers for a kind of color expression that cannot be achieved with other methods. So many black-and-white darkroom workers who have mastered relatively difficult techniques have felt limited because there was no way to add color except on the surface. This does not produce as pure a quality as desired. Now, with Flexichrome dyes, your picture will have a lifelike brilliance because in effect you are hand-coloring a transparency which adheres to a white paper support. This property of Flexichrome, to be colored as desired with the colors becoming an integral part of the picture, is its basic claim to distinction and its most challenging feature.—

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A fabulous 35mm accessory imported from Germany by us. It will astound you and the entire industry. Just drop us a card with your name and address saying "35mm" and you shall receive the most sensational information on the most terrific "bombshell" exclusive for 35mm owners!

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Latest Model 1054

2 x 2 Slide Projector with SLIDEX, the Truly Automatic Slide Changer! 4" F3.5 Coated Lens. 300 Watts. Complete with Carrying Case

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Bolsey B, f3.2 coated	54.00	21.50	19.95
Contaflex, ctd. f2.8 Tessar	169.50	89.50	67.80
Contax IIA, f2 ctd. Sonnar	336.00	189.50	134.00
Contax IIIA, f1.5 Ctd. Sonnar	412.00	216.00	176.00
Contessa, ctd f2.8 RFMX			67.50
Edinex, ctd f2 Xenon	99.50	43.50	34.95
Graflex Ciro 35, f3.5	59.00	38.50	32.50
Kodak Signet, f3.5	75.00	48.00	36.50
Kodak Retina II, f2 CRF		61.00	49.50
Kodak Retina IIa, f2	149.50	104.95	65.00
Kodak Retina IIIc	190.00	136.50	110.00
Leica IIIF, f1.5 Summitar	358.00	228.00	170.00
Leica IIIF, f2 Summitar	324.50	188.50	142.00
Leica IIIC, f2 Summitar		153.50	112.00

8mm cameras

B&H 220, f2.5 coated	39.50		23.00
B&H 134TA, f1.9 coated	159.95	97.50	65.95
B&H 172A, f1.9 coated	199.95	133.50	115.50
Bolex B8, f1.9 coated	154.50	111.50	86.50
Bolex C8, f2.5 coated	89.95	63.50	46.50
Revere 84, f2.5	124.50	58.50	

8mm projectors

B&H Monterey, 500w	79.95		43.00
B&H Regent, 500w	179.95	125.50	88.50
Keystone	169.50		74.95
Revere 85, 500w	114.50	77.50	52.95

16mm cameras

B&H 200L, f1.9 coated	365.50	299.50	195.00
Bolex H-16 Leader, f1.9	269.50	183.00	146.00
Bolex H-16 Deluxe, f1.9		228.00	188.50

2¼ x 2¼ reflex

Ciroflex D, f3.5 coated	84.50	46.75	31.75
Ciroflex C, f3.5 coated	75.00	48.50	34.95
Flexaretta, f3.5 coated	89.50		32.50
Graflex 22, f3.5 ctd sync	93.50	63.00	40.00
Hasselblad, f2.8 Ektar	379.50	238.50	193.45
Kodak Reflex II, f3.5 ctd	155.00	73.50	49.50
Rolleicord III, f4.5		72.50	56.00
Rolleicord V, f3.5	134.50	94.00	74.00
Rolleiflex Auto, f3.5 Tess		106.00	98.00
Rolleiflex Auto, f3.5 Tess Sync		121.00	99.50
Rolleiflex Auto, f3.5 MX	229.50	146.00	111.00

16mm projectors

B&H 270, A/750w	199.95	125.00	
Kodascope, 16, 20 750w	225.00		179.50
Revere 48	182.50	94.00	72.50

slide projectors

Argus PB 400	48.50	38.95	21.00
Gavin Manumatic, 300	58.50	48.50	22.95
La Berna 75, 500w case	154.95	123.50	92.00
GVI Skyline, Auto 300	39.50	24.50	26.00
TDC Streamliner, 300w	84.50	67.50	46.00
TK Model D, 300w	67.50	41.00	29.00

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Guide Numbers	
Plus X and Verichrome	155
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Supreme	160
Ingpan	180
Superpan Press	220
428	275

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BOLSEY 'C,' Reflex case & flash BRAND NEW $49.75

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- All Metal Construction
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WHAT'S NEW - TRADE NOTES AND NEWS

All data and descriptions ascribed to products listed herein are those claimed by the manufacturers and distributors, and listings are not to be construed as endorsements by POPULAR PHOTOGRAPHY. For further information write to address given in trade note.

CAMERAS

K-28, an 8-mm roll-film, turret movie camera has fixed-focus normal *f*/1.9 and 38-mm telephoto *f*/3.5 interchangeable lenses with iris-leaf diaphragms; optical-glass finder with an etched triangle for telephoto view; three-way trigger for regular or continuous run and single-frame exposure; footage indicator which sets automatically when film is inserted and signals if film accidentally jams; foldaway, crank-type handle; built-in exposure guide. A new product from Keystone Cam. Co., Hallet Sq., Boston 24, it is priced at $89.95.

DUAL, a Super Ricohflex twin-lens-reflex camera comes with two interchangeable backs, adapting it to both 120- and 35-mm film. The 80-mm coated and color-corrected *f*/3.5 lenses are matched and shutter speeds range to 1/200 sec and B. Other features are ground-glass focusing, eye-level action finder, wide-angle magnifier, and depth-of-focus scale. Distributor is Riken Optical Ind., 521 Fifth Ave., New York 17, and the price is $39.90.

GRAPHIC 35, a 35-mm camera is now available with a system which gives exposure settings for any combination of flash and film without calculations. Known as the Universal Spectramatic Graphic 35, it is equipped with an *f*/2.8 lens, self-timer, split-image rangefinder, push-button focusing, double-exposure prevention, and exposure counter, and is priced at $99.50, incl. case and flash. Manufacturer is Graflex, Inc., 154 Clarissa St., Rochester, N. Y.

LENSES

KINOSCOPE ANAMORPHIC lens (used on camera and projector) increases width by 50%, creating a 2 to 1 ratio in projection. It fits all 8-mm cameras (except for the Revere 50) and is adaptable to some 16-mm models. This Rochester-made lens is coated and color-corrected and fits Series C adapters. Price is $27.95. Available accessories include leather case, $2.95; anamorphic viewfinder which attaches to camera by means of a collapsible bracket, $6.95; and a 25x50-in. headed tripod screen, $14.95. Distributor is Spiratone Inc., 135-06 Northern Blvd., Flushing 54, N. Y.

3-in. KINOTEL *f*/2.5 telephoto lenses in a C mount for 16-mm cameras have been redesigned. Especially narrow, to fit small turrets, the new model has clickstops, depth-of-field scale, and a Series VI filter holder. Priced at $42.50, it is distributed by Photographic Imp. & Dist. Corp., 67 Forest Rd., Valley Stream, N. Y.

WIDE-ANGLE 28-mm Summaron *f*/5.6 lens has an angle of view of over 75 degrees; a parallel focusing mount; and couples to rangefinder. Distributed by E. Leitz, Inc., 468 Fourth Ave., New York 16, price is $105. The Leitz Imarect viewfinder can be used with this lens by means of a special adapter which screws into the front end.

VOTAR 8-mm matched lens sets are introduced by Voss Photo Corp., 601 W. 156th St., New York 32. Available combinations are: 1½-in. telephoto *f*/2.5 and 6.5-mm wide-angle *f*/2.5 ($56.50); 1½-in. telephoto and 6.5-mm wide-angle *f*/1.9 ($79.90); and 1½-in. telephoto *f*/1.4 and 7.5-mm telephoto *f*/1.4 ($116). All lenses have click-stop diaphragms and are coated and color corrected. They are designed for use on narrowest-turret cameras as well as standard models and come in velvet-lined jewelry cases.

600-mm FERN-KILAR *f*/5.6 lens can be used on 35-mm single-lens reflex cameras, on 35-mm rangefinder cameras with a reflex housing, and with 16- and 35-mm movie cameras. Smallest aperture is *f*/45, angle of field is 4 degrees, focusing range from 65 ft to inf., and weight is nine lb. Other features are preset diaphragm, screw-in lens shade, filter slot and holder for 2x2 gelatin filters, tripod socket, and engraved scales and calibrations. Distributed by Kling Photo Corp., 257 Fourth Ave., New York 10, the price is $599.95.

FOLLOW FOCUS mount features focusing by means of a pistol grip and trigger, leaving the other hand free to trip shutter when desired. For single-lens-reflex cameras, the mount is available with a 240-mm Novoflex *f*/4.5 or a 300-mm Novoflex *f*/5.6 lens. For other 35-mm cameras, only the *f*/5.6 lens can be used. Price for either lens is $249.50. Adapters are available for using the 400-mm Novoflex lens with this mount and also for use on more than one camera. Full details from Royal Photo Dist., 78 W. 47th St., New York 36, or Miller Outcalt Co., 1050 N. Lillian Way, Hollywood 38, Calif.

28-mm ANGENIEUX *f*/3.5 wide-angle lens is now available for the Alpa camera. It has a 75-degree angle of coverage; preset diaphragm; stops down to *f*/22; focuses down to 2 ft; and accepts Series VIII filters. Price, $129; leather case with strap, $8.85. Information available from Karl Heitz, Inc., 480 Lexington Ave., New York 17.

ERCONA CORP. (Scientific Inst. Div.), 551 Fifth Ave., New York 17, announces recent recalculation of the optical formula and introduction of heavy-element glass has resulted in improvements on the 150-mm Astro Pantachar *f*/1.8 lens. Near-perfect definition is claimed with all emulsions. The lens is supplied with a dual-purpose mount permitting interchange on still and movie cameras. Price is $345. Complete information is available.

FILTERS

FLASH TYPE Anscochrome filters are announced by Tiffen Marketing Co., 71 Jane St., Roslyn Heights, L. I., N. Y. No. 85C is recommended for daylight exposures at an exposure index of 25. No. 82A is for use with photoflood (3400K) exposures at an exposure index of 20. Prices start at $1.75, for the Series IV size.

FLASH

PHOTO ELECTRONIC RES., 141 W. 42nd St., New York 14, offers the ML BD which converts many electronic-flash units into studio equipment. It extends reflector depth 2½-in. and diameter to seven in. Housing rotates 360 degrees and has barn doors for predetermining subject lighting. Price, incl. line cord and switch, $17.95; 60 T incandescent lamp, $1.85; 100 T lamp, $3.20. ML C is a modeling light clamp-on assembly for use with studio-type reflectors and is adjustable up or down. It uses same lamps as above. Price, incl. line and switch, $9.25.

AUTOMATIC is the name of a Braun Hobby electronic-flash unit with push-button controls. The "keyboard" offers finger-tip choice of full- or half-power (50 watt-sec) and a-c or wet-cell operation. It also has a built-in charger for the storage battery. Price is $106, incl. battery, vibrator, and 13 ft cord. E. Leitz, Inc., 468 Fourth Ave., New York 16, is the distributor.

AC POWER SUPPLIES are announced by Photo Lectronic Res., 141 W. 42nd St., New York 14. Model AC 400 S is for studio use and replaces batteries. Recycling time for four Stroboflash II speedlights is six sec. It has also a built-in charge indicator, switch, safety fuse, and a-c power outlet. Model AC 800 S is similar but incorporates an output voltmeter and will charge four Stroboflash III or IV units in 10 sec. Prices are, respectively, $89.90 and $129.89.

SYLVANIA Elec. Prods. Inc., 1740 Broadway, New York 19, announces price changes on Blue Dot flashbulbs. They are, Press 25, 13 cents; Press 25B, 16 cents; SF, 15 cents; M-2, 10 cents; M-2B and Bantam 8, 12 cents each.

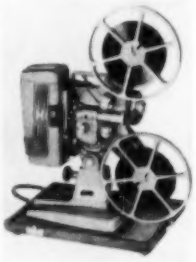
GENERAL ELECTRIC, Nela Park, Cleveland 12, Ohio, announces price changes on part of their line of flashbulbs. PowerMite M2 and M2B; SM; Nos. 5, 5B, 8, and 22B are increased one cent each. Unaffected are Nos. 6, 6B, 11, 11B, 22, 31, 31B, 50, and 50B.

TRIPODS & ACCESSORIES

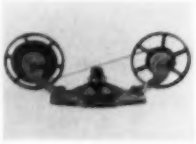
ACCURA POCKET tripod supports 35-mm and 2¼x2¼ cameras; extends to 49 in. (top section of all three legs can be lowered 8 in.); can be secured in intermediate positions; and is made of brass. The importer, Accura Industries, 135 Broadway, N. Y. 6, gives the price as $8.95.

S.O.S. JUNIOR is a medium-weight, professional-type tripod introduced by S.O.S. Cinema Supply Corp., 602 W. 52nd St., New York. Features include single leg-tightening knob; adjustable two-position offset pan handle; hardwood legs with aluminum supports; positive pan and tilt locks; and tie-down eyelets. Weighing 14 lb, it extends to 75 in. and telescopes to 41 in. Price is $145. For heavier 16- and 35-mm cameras, a Senior model is available for $295.

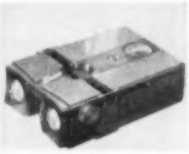
PROJECTING & VIEWING EQUIPMENT



K-105, an 8-mm projector, is introduced by Keystone Camera Co., Hallet Sq., Boston 24. It features a 750-watt lamp; removable condenser; geared forward-and-reverse film wind; blower cooling; light-o-matic switch (turns room light on and projector lamp off); automatic rewind; self-locking tilt mechanism; and a frame-viewing knob which moves film one frame at a time. Reel capacity is 400 ft. Price, incl. case, cord, reel, lamp, and instructions, $149.50.



EIGHT-MM editing equipment is introduced by Kalart Co., Inc., Plainville, Conn. The Kalart Custom 8 Splicer-Rewind (right) has fold-a-way rewinds which can be manually operated without operating splicer. The Kalart Custom 8 splicer has steel pins on base plate to engage film's sprocket holes; spring latches to hold the film firmly when cutting and splicing; and a built-in floating scraper. The combination unit is priced at $10.95; splicer alone is $4.95. Both have receptacle in base for holding film cement.



ST64 stereo viewer is introduced by Realist, Inc., 315 W. Court St., Milwaukee, Wis. It has focusing and interocular adjustments and optical-glass lenses. Built-in illumination is supplied by two D batteries. The viewer is priced at $12.95.

3½x4 ALUMINUM slide binders with three sizes of silver paper masks for 2¼x3¼ films and full lantern-slide sizes is announced

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- SELF-COCKING SHUTTER

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FAMOUS BERTHIOT MATCHED LENS SET
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OUTFIT III
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- AO 300, Airequipt Changer, Case
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- Mansfield, Auto Changer and Case
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- NORWOOD FLASHRITE 3.95
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- 400mm F5.5 TELE PIEKSKAR PS ..... 119.50 (For Exakta, Pentacon, Etc.)

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Lenses for EXAKTA, PRAKTICA

	Used Price	Cash or Trade
28mm f3.5 Angenieux	67.50	55.00
35mm f2.5 Angenieux	54.50	40.00
35mm f2.8 Zeiss Auto	99.00	75.00
35mm f4.5 Lithogon	39.50	25.00
40mm f3.5 Makro-Kilar	56.00	40.00
40mm f3.5 Makro-Kilar	76.50	60.00
50mm f1.5 Angenieux PS	105.00	80.00
50mm f2.8 Westanar Auto	41.50	30.00
50mm f1.9 Xenon Auto	116.50	85.00
58mm f2 Biotar PS	61.50	40.00
75mm f1.5 Biotar	91.50	70.00
90mm f2.5 Angenieux	56.00	40.00
135mm f3.5 Angenieux	52.00	40.00
135mm f4.5 Xenar	47.00	30.00
180mm f5.5 Xenar	47.00	35.00
240mm f5.5 Xenar	75.50	55.00
300mm f5.5 Xenar	94.50	75.00
400mm f5.5 Megor	95.00	75.00
400mm f5.6 Novoflex	114.00	85.00

Lenses for LEICA, CONTAX

	Used Price	Cash or Trade
28mm f3.5 Nikkor	77.50	65.00
28mm f3.5 Serenar	77.50	55.00
35mm f2.8 Rogon	76.00	65.00
35mm f2.5 Nikkor	94.50	70.00
35mm f3.2 Serenar	67.50	45.00
35mm f3.5 Nikkor	52.50	40.00
35mm f3.5 Summaron	54.50	40.00
50mm f2 Summitar	59.50	40.00
50mm f3.5 Elmar	32.50	25.00
50mm f2 Summicron	96.50	75.00
85mm f1.9 Serenar	104.00	80.00
85mm f2 Sonnar	78.00	60.00
85mm f2 Nikkor	86.00	70.00
85mm f1.5 Summarex	177.50	140.00
90mm f4 Elmar	54.50	40.00
125mm f2.5 Hektor	93.50	70.00
135mm f3.5 Nikkor	67.00	50.00
200mm f4.5 Telyt	102.00	75.00
135mm f4.5 Hektor	61.50	40.00
135mm f4 Sonnar	76.50	65.00

LEICA CONTAX NIKON CANON

	Used Price	Cash or Trade
Contax IIA f2 Sonnar	131.50	115.00
Contax IIA f1.5 Sonnar	155.00	135.00
Contax IIIA f2 Sonnar	169.00	135.00
Leica IIIA f2 Summar	76.50	55.00
Leica IIIC f2 Summitar	96.00	80.00
Leica IIIF f2 Summitar	143.50	120.00
Leica IIIF f2 Summicron	174.00	145.00
Nikon S2 f2 Nikkor	184.00	145.00
Nikon S2 f1.4 Nikkor	219.00	175.00

35MM SINGLE LENS REFLEX

	Used Price	Cash or Trade
Contaflex I f2.8 Tessar	98.00	75.00
Exakta VX f2.8 Tessar PS	149.50	120.00
Exakta VX f2 Biotar Auto RF	221.50	180.00
Exakta VT f2 Biotar PS	159.50	135.00
Exakta VT f2 Westagon Auto	167.00	140.00
Pentacon f2 Biotar PS	126.50	100.00

35MM CAMERAS

	Used Price	Cash or Trade
Argus C3 f3.5 Outfit	32.95	25.00
Argus C-4 f2.8	49.50	35.00
Kodak 35 f3.5 RF	27.50	20.00
Kodak Retina IIIC f2	112.00	85.00
Kodak Signet f3.5	39.50	30.00
Minox IIIS f3.5 outfit	76.50	55.00
Mercury II f2.7	17.50	10.00
Robot Royal f1.9	134.50	116.00
Minolta A f3.5 RF	29.50	20.00
Robot Star f1.9 Xenon	73.00	55.00
Voigt Vitessa L f2	99.50	75.00

2¼x2¼ REFLEX CAMERAS

	Used Price	Cash or Trade
Exakta 66 f2.8 Tessar	177.50	150.00
Graflex 22 f3.5	42.50	30.00
Minolta Autocord f3.5	64.00	50.00
Rolleicord IV f3.5	63.00	50.00
Rolleicord V f3.5	85.00	70.00
MX Rollei f3.5 Xenar	113.00	100.00
MX Rollei f3.5 Tessar	121.50	105.00
MX Rollei f2.8	172.00	140.00

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6 Rolls	18.50
10 Rolls	29.99
16mm—100 FT.	
1 Roll	8.50
3 Rolls	24.99
5 Rolls	39.99
8mm—25 FT. MAGS.	
3 Mags.	11.99
10 Mags.	38.59
16mm—50 FT. MAGS.	
3 For	17.50
10 For	53.55

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35MM STEREO CAMERAS

	Used Price	Cash or Trade
Kodak Stereo f3.5	45.50	30.00
Revere f3.5	71.50	60.00
Stereo Realist f3.5	62.50	55.00

ROLL FILM CAMERAS

	Used Price	Cash or Trade
Kodak Medalist I f3.5	52.00	40.00
Polaroid Highlander	37.50	30.00
Super Ikonta A f3.5	43.50	30.00
Super Ikonta B f2.8	67.00	50.00
Super Ikonta C f3.5	57.50	40.00

PRESS CAMERAS

	Used Price	Cash or Trade
23 Ann. Graphic RF f4.5	79.50	55.00
45 Ann. Graphic RF f4.5	87.50	65.00
45 Linhof Super Tech RF f4.5 MT	197.00	165.00
23 Linhof Super Tech RF 3 Lenses Comp.	309.50	270.00
45 Pace Speed f4.7 RF	167.50	130.00

8MM CAMERAS

	Used Price	Cash or Trade
B & H 172 B f1.9	87.50	75.00
B & H 13 V f2.5	37.50	28.00
Bolex B-8 f2.8	67.00	55.00
Bolex C-8 f2.5	53.50	35.00
Bolex H-8 Leader f1.9	141.50	115.00
Kodak Brownie f2.7	18.50	14.00
Kodak Brownie f1.9	24.00	18.00
Revere 88 f2.5	36.25	20.00

8MM PROJECTORS

	Used Price	Cash or Trade
Bolex M-8 500W	98.25	85.00
DeJur 750W	68.50	55.00
Keystone K95M 750 W	65.50	50.00
Keystone K100M 750W	73.75	65.00
Revere 85 500W	48.50	40.00
Revere 90 750W	64.00	55.00

16MM PROJECTORS

	Used Price	Cash or Trade
Bolex G8-16 750W	219.00	150.00
B&H 273 A 750W	98.50	85.00
B&H 173 750W	159.00	125.00
Keystone A-82 750W	62.50	55.00
Keystone K-161 750W	73.50	60.00
Revere 48 750W	74.00	60.00

16MM CAMERAS

	Used Price	Cash or Trade
Auricon f1.9	534.00	350.00
B&H 200T f1.9	155.50	125.00
B&H 70DL f1.9	216.50	175.00
B&H 200 f2.5	106.50	80.00
Bolex H-16 Leader f1.9	147.50	120.00
Bolex H-16 DeLuxe f1.5	289.00	225.00
Bolex H-16 Leader (3 lenses)	197.50	175.00
Bolex Pan Cinor f2.8 lens	157.00	125.00
Cine Kodak Mag. f1.9	53.50	45.00
Cine Kodak 100 f1.9	167.00	140.00
Cine Kodak Royal f1.9	92.50	70.00
Keystone A-12 f1.9 Tur	95.50	70.00
Keystone A-19 f2.5	56.50	45.00
Keystone A-15 f1.5	126.00	95.00
Keystone Mag. f1.9	102.50	80.00

16MM SOUND PROJECTORS

	Used Price	Cash or Trade
B&H 285C 1000W	279.00	215.00
B&H 202C 1000W	389.00	325.00
Revere SF16 750W	159.00	135.00

SLIDE PROJECTORS

	Used Price	Cash or Trade
Revere 553 Auto 300W	39.50	30.00
Revere 555 Auto 500W	43.50	35.00
TDC Duo 300W 2¼x2¼	34.50	28.00
TDC Headliner 300W	24.50	18.00
TDC Mainliner 300W	29.50	22.00
AO 500 Auto 500W	39.50	30.00
Brumberger 300 2¼x2¼	34.50	25.00

EXPOSURE METER

	Used Price	Cash or Trade
Argus	10.95	7.00
Brockway M2 (Norwood)	15.95	10.00
Brockway M3	19.95	7.00
GE DW68	19.95	8.00
GE PRI	15.50	10.00
Leica	14.95	10.00
Minilux	6.75	4.00
Minox	15.50	8.00
Polaroid	8.50	6.00
Sekonic	3.50	3.00
Weston Dr.	10.50	8.00
Weston II Universal	13.50	10.00

MINIFILM CAMERA CORP. DEPT. P-11

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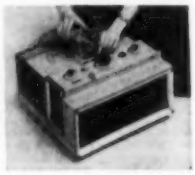
by Emde Prods., 2040 Stoner Ave., Los Angeles 25. They are priced at $3 per box of 12 and $12 per box of 50.

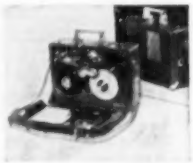
SOUND PROJECTION EQUIPMENT

CORDOMATIC is an accessory extension unit for the J12, a 16-mm projector speaker. A governor-controlled reel rewinds the 50-ft length of cord automatically. Price is $25.25 (less installation) and information is available from Victor Animatograph Corp., Davenport, Iowa.



LOAD-A-MATIC is entered into the tape-recorder field by Keystone Camera Co., Hallet Sq., Boston 24. It uses magazine-loaded tape and regular tape reels. Featured is an 8-watt amplifier claimed to reproduce undistorted tones of from 40 to 15,000 cycles; three speakers, electronic tuning eye, index counter, and two motors eliminating belts and linkages in forward play and rewinding. Price is $199.50.

FERRO-SHEEN process tape, claimed to have the smoothest, most firmly anchored and homogeneously bonded layer of magnetic oxide produced on recording tape is now part of the Irish Green Band brand. A 7 in. reel holding 150 ft is priced at 70 cents; 600 ft is $2.25, and 1200 ft is $3.50. Manufacturer is OhRadio Ind., Inc., Opelika, Ala.



TAPAK DUPLEX NEWSCASTERS are offered in three models by Broadcast Equipment Specialties Corp., Box 149, Beacon, N. Y. In addition to broadcast-quality recording they have the usual earphone playback, and also a built-in speaker for room-size audience reception. Battery life is conserved through the use of transistorized bias oscillator and subminiature basic amplifier. Triplex and Simplex models also are available, the first incorporating VU meter and 600-ohm zero-level output for line feeding, the latter lacking the loudspeaker. Prices are: Duplex, $349.50; Triplex, $399.75; Simplex, $289.50.

CONGRESSIONAL (Model 7TR2) is a tape recorder introduced by RCA, 30 Rockefeller Pl., New York 20. It features a four-tube (incl. rectifier) amplifier; 5x7 speaker; high-impedance ceramic microphone with 7-ft cord; push-buttons for play, record, fast forward, and fast rewind; 7½ and 3¾ ips speeds; pilot light; and recording level indicator. Price, in simulated-leather case, is $159.95.

FILM

ADOX FILM price reductions are announced by E. Leitz, 468 Fourth Ave., New York 16. A 35-mm 36-exp. cartridge is now $1.30, 50-foot rolls in bulk loads, $4.80; and 120 roll film is now 50 cents.

KODACHROME movie film in 8- and 16-mm sizes is now being sold without the processing charge included in the price. Prices for 8-mm are $2.40 for a 25-ft spool and $3.75 for a 25-ft magazine, incl. deposit. A 16-mm magazine of 50 ft is $5.95, incl. deposit, and a spool of 100 ft is $7.15. Processing charges through Kodak dealers, are respectively, $1.50, $1.10 (incl. dep. refund), $1.25 (incl. dep. refund), and $3.50.

KODACHROME Professional Film, Type A, is now available in the 135, 36-exp size only, balanced for use with photoflood illumination. Both exposure indexes and filter data are the same as those previously recommended for Kodachrome, Type A. Price is $2.60 per roll and processing is extra.

DARKROOM EQUIPMENT

ENLEY PUP produces demineralized water claimed to be equal to triple-distilled water. Ion-exchange material can be regenerated or replaced when exhausted. Available in sizes to provide from 300 to 3,000 gal of mineral-free water, prices start at $49.95. Manufacturer is Enley Products, Inc., 1236 Broadway, Brooklyn 21.

EDWAL NO-SCRATCH, when applied to a scratched negative, is claimed to hide practically all scratches, clean the film, and

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20 Exp. 1 Roll $2.49 3 for 6.69
36 Exp. 1 Roll $3.75 3 for 9.95
PRICE INCLUDES DEVEL. & MTG.
28 ft. NEW ANSCOCHROME
with FREE BULK Film Loader, 4 Carts & mailing bags $14.95
PRICE INCLUDES DEVEL. & MTG.

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COLOR PRINTS
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PRICE INCLUDES DEVEL. & MTG.
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35mm EKTACHROME
NOT AERO-EKTACHROME
20 EXP. 1 ROLL $2.49 3 ROLLS 6.99
36 EXP. 1 ROLL $3.99 2 ROLLS 7.49
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COLOR FILM DEVELOPING
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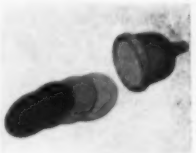
20 EXP. EKTACHROME
DEVELOPED AND MOUNTED
$1.00 Per Roll • 3 for $2.75
120/620 ANSCO or EKTACHROME
DEVELOPED • $1.00 PER ROLL
2 FOR $1.75 • 3 FOR $2.75
KODACHROME DEVELOPING
20 EXP. MTD
$1.25 Per Roll • 3 for $3.50
36 EXP. MTD
$2.00 Per Roll • 3 for $5.25
15 EXP. STEREO MTD
$1.75 (15 Pairs)
20 EXP. STEREO MTD
$2.85 (20 Pairs)
Stereo Kodachrome
20 EXP. — 3 ROLLS $9.99
PRICE INCLUDES DEVELOPING AND STEREO MOUNTING
PLEASE ADD 15c POSTAGE FOR FILM ORDERS.
CALIF. RESIDENTS ADD 3% SALES TAX
*Reloads

GOLDEN GATE COLOR PRINTS DEPT. P11 P. O. BOX 46056 COLE DR
HOLLYWOOD 46, CALIF.

afford some preservative action. A ½-oz bottle is priced at 89 cents and the 4-oz size is $3.95. Edwal Scientific Prods. Corp., 420 W. 11th St., Chicago 28, claims one drop is enough per negative.

OMEGA EASEL is of all metal construction; takes paper up to and including 11x14; is one inch high; has visual margin control and positive paper stop. Designed mainly for Autofocus enlargers it can be used with all enlargers. Price is $49.50; optional titling attachment, $8.50. It is made by Simmon Bros., 30-28 Starr Ave., Long Island City 1, N.Y.



YANKEE SAFE-LIGHT is announced by Yankee Photo Prods., 3325 Union Pacific Ave., Los Angeles 23. Housing of jet black has adapter ring which holds 4½"-diameter color filter in place. Unit screws into any drop cord or outlet, uses a 15-watt lamp, and comes with four filters: red, orange, green, and brown "V" (for variable contrast papers). Price, complete, $3.95; filters alone (for earlier models of Yankee safelights), $2.75.

THERMOMETERS for trays and stirring are introduced by Taylor Inst. Co., Rochester, N. Y. Both are filled with easy-to-read black liquid and the tray thermometer can be mounted in any position and has Fahrenheit and Centigrade scales. Price is $1.50 and stirring-rod model is $2.75.

CLAYTON H-N is a hypo neutralizer which cuts washing time of films and papers. A product of Clayton Chemical and Pkg. Co., 5420 N. Damen Ave., Chicago 25, it is priced at $1.25 per qt and $4 per gal, in concentrated solution.

TEMP-TUBE is a device for controlling the temperature of processing solutions. Made of an anodized aluminum alloy, it is claimed to have a lifetime of continuous, trouble-free use. Price is $3.89, from the Mimarax Co., P. O. Box 895, Memphis 1, Tenn.

PROCESSING SERVICES

CALEV BROS., 25 Beekman St., N. Y. C., long-established black-and-white photo finishers, have entered the color-print field. Using Kodak type R paper exclusively, prints are priced at 35 cents for wallet size from 35-mm; 60 cents for 3½x5 from 35-mm and 2¼x3¼; and 60 cents for 3½x3½ from 2¼x2¼ and single-frame, stereo positive-color transparencies. Except for wallet size, all prints have a white border. Calev Bros. will also accept Anscochrome and Ektachrome for processing.

OHIO FILM STUDIO, 606 Powersdale Ave., Youngstown 2, Ohio, offers a processing service for users of Aero Ektachrome, Anscochrome, Ansco Color, and E-2 Ektachrome. Films are handled individually in stainless-steel reels and are mailed back within 48 hours of receipt. Charges for 35-mm and 120/620 are: Aero Ektachrome, 95 cents; Anscochrome or Ansco Color, $1.10; E-2 Ektachrome, $1.25. Mounting is free for 35-mm. Matte sleeves are provided for 120/620; add 20 cents for mounting, if desired.

MISCELLANEOUS

FRESNEL LENSES for spotlights are available from Edmund Scientific Corp., Barrington 16, New Jersey. Diameters and prices are: 3-in., 75 cents; 4½-in., $1; 5-in., $1.50; 6-in., $2.25; 8-in., $3.25. The latter two are heat-resistant and can be used with high-wattage lamps.

LEATHER NAMEPLATES for identification on all types of photographic equipment have press-on adhesive backs and gold inscriptions on black, brown, tan, or blue leather backgrounds. A set of 8 is priced at $1.98 and a sample is free on request from Stylecraft, 389 Broadway, New York 13.

MORGAN & MORGAN, 101 Park Ave., New York 17, is the new name of the long-established publishing firm of Morgan & Lester. They also announce the sixteenth edition of Photo-Lab-Index, including all latest photographic data, at $19.95. Quarterly Supplement Service, to keep the book up-to-date, is priced at $3 per year.—

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All lenses latest models, coated. We are not permitted to advertise their famous names. Manufactured in Germany, Italy, France and Japan. Complete information is available upon request. When ordering, please specify with which camera the lenses will be used.

Lenses for EXAKTA, CONTAX D, PRAKTICA, Contax S, ConSol, Exa, Praktina, Pentacon, Praktiflex, Rival Reflex, Hexagon, Hexagon Supreme, and similar cameras.

28mm f3.5	$ 88.95	135mm f3.5	39.93
35mm f2.5	74.50	135mm f3.8	35.00
35mm f2.8	109.50	135mm f4	48.00
35mm f4.5	48.35	135mm f4.5	29.95
40mm f3.5	37.50	150mm f1.8	258.75
40mm f4.5	37.50	150mm f2.3	206.25
50mm f1.5	123.50	150mm f3.5	98.95
50mm f1.9	69.50	150mm f5.5	65.50
50mm f2	52.15	165mm f3.5	146.25
50mm f2.8	53.50	180mm f2.8	229.50
50mm f3.5	24.50	180mm f3.5	146.25
58mm f2	49.50	180mm f4.5	72.00
75mm f1.5	119.50	180mm f5.5	59.95
75mm f1.9	119.95	200mm f4.5	115.00
80mm f2	74.50	240mm f5.5	93.75
80mm f2.8	66.50	250mm f5.5	93.35
85mm f1.5	93.35	300mm f3.5	270.00
85mm f2	98.00	300mm f4	329.50
85mm f2.8	49.85	300mm f5	145.25
90mm f1.8	112.50	300mm f5.5	104.95
90mm f2.5	74.50	300mm f5.6	121.45
90mm f2.8	189.95	360mm f5.5	112.13
90mm f3.5	68.50	400mm f4.5	270.00
90mm f4	24.95	400mm f5	183.75
100mm f2.8	48.00	400mm f5.5	149.65
100mm f3.5	25.85	400mm f5.6	188.95
100mm f4.5	15.95	500mm f5	296.24
102mm f4.5	99.25	500mm f8	356.25
105mm f3.5	59.95	600mm f5	423.75
105mm f4.5	19.95	640mm f5	543.75
125mm f2	180.00	800mm f5	671.25
125mm f2.3	146.25	800mm f6.3	562.50
135mm f2.5	134.65	1000mm f6.3	828.00
135mm f2.8	112.15		

Lenses for CONTAX, NIKON, and Similar Cameras

21mm f4.5	$186.75	135mm f3.8	76.45
25mm f4	127.15	135mm f4	109.50
28mm f3.5	112.15	150mm f1.8	371.25
35mm f2	139.00	150mm f2.3	206.25
35mm f2.5	104.65	150mm f3.5	89.95
35mm f2.8	129.00	180mm f2.5	310.00
35mm f3.5	67.15	180mm f2.8	540.00
50mm f1.1	450.00	250mm f4	243.00
50mm f1.5	99.80	300mm f4	346.25
50mm f2	55.50	300mm f5	183.75
50mm f2.8	59.50	300mm f5.6	112.45
50mm f3.5	46.50	400mm f5	179.95
75mm f1.5	131.24	400mm f5.6	174.95
85mm f1.5	224.85	500mm f5	408.25
85mm f2	129.50	500mm f8	626.25
85mm f4	79.50	600mm f5.6	521.25
90mm f3.5	63.75	640mm f5	656.25
105mm f2.5	114.35	800mm f5.5	787.50
125mm f2.3	145.95	1000mm f6.3	937.50
135mm f3.5	101.25		

Lenses for LEICA, CANON, Tower, Leotax, Kardon, and Similar Cameras

25mm f4	$127.00	100mm f2.8	52.50
28mm f3.5	88.95	100mm f3.5	25.90
28mm f5.6	79.00	105mm f2.5	115.00
35mm f1.8	139.00	125mm f2.5	110.00
35mm f2	143.50	135mm f2.5	135.00
35mm f2.5	70.00	135mm f3.5	56.25
35mm f2.8	72.00	135mm f3.8	48.50
35mm f3.5	69.00	135mm f4	56.25
45mm f4.5	37.25	135mm f4.5	34.50
50mm f1.1	450.00	150mm f2.3	295.00
50mm f1.4	139.00	150mm f2.8	371.00
50mm f1.5	119.50	150mm f3.5	188.00
50mm f2	77.50	180mm f2.5	299.50
50mm f2.8	53.00	180mm f5.5	59.95
50mm f3.5	34.50	200mm f4.5	117.00
85mm f1.5	149.50	250mm f5.5	93.50
85mm f1.9	119.50	300mm f5.6	97.50
85mm f2	93.25	400mm f5	414.00
85mm f2.8	63.50	500mm f5	412.50
90mm f1.8	115.85	640mm f5	656.00
90mm f2.5	70.90	800mm f8	660.00
90mm f4	29.95	1000mm f6.3	937.00

Lenses for HASSELBLAD, Primer Reflex, Master Reflex, TV Cameras. Prices on request.

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Bessa 2¼x3¼	44.75	Minolta A	37.50
Voigtlander		Praktica	42.50
Vitessa 35mm	74.50	Rectaflex	182.50
Voigtlander Vito	39.50	Ansco Regent	67.00
Voigtlander		Ricoh 35	47.50
Prominent	118.00	Ricohflex	22.65
Bolsey	38.75	Robot Royal	187.50
Canon IVS-2	122.95	Soligor 35	29.95
Canon V	200.00	Soligor 66	74.50
ConSol	89.50	Contessa	79.50
Pentacon	89.50	Nikon	195.00
Contaflex	111.00	Rolleicord	99.50
Contaflex II	134.50	Stereo Realist	79.50
Contax IIA	149.50	Bolex H-8	159.00
Contax IIIA	187.50	Bolex H-16	164.00
Ikoflex	74.25	Pathe Super 16	299.50
Ikoflex IB	89.25	Kodak Retina IIA	89.50
Ikoflex IC	89.25	Kodak Retina IIC	104.50
Super Ikonta III	72.00	Kodak Retina IIIC	142.50
Super Ikonta BX	122.25	Leotax	99.50
Hasselblad	289.50	Nicca	59.50
Edixa	34.95	Tower	49.95
Edixa Stereo	46.95	Kalloflex	89.50
Universal Stereo	29.95	Minox III	79.50
Eumig 8mm	98.95	Flexarette	49.75
Exa	34.50	Welti	36.95
Exakta	115.00	Minolta Autocord	74.50
Konica	64.50	Plaubel Makina	199.50
Rolleiflex	187.50	Diax IIb	74.50
Rolleiflex 2.8C	187.50	Steky	16.95
Leica IF	52.75	Gami	289.50
Leica IIF	94.00	Minicord	109.95

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Weston Master II	11.25	Minerex	7.35
Weston Master III	22.95	Minox	21.00
Weston DR	12.95	Sixti	19.95
Norwood Director	22.25	Ikophot	20.00
Argus L-3	12.55	Kodalux	19.95
Argus L-44	13.25	Sekonic Leader	5.65
Leica Meter M	22.50	Sekonic Compact	7.35
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3 for 2.50 6 for 4.75

100' BULK—Tungsten
(Free day. filter) 13.95

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1956 Dated!
35mm x 20-Exp. (ASA40)
120 & 620 (ASA40 or 100)
1.75 ea. 3 for 4.95
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120 and 620 ROLL FILM!
Super-XX (100ASA)
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LW, SM (AS) or SW, SM (E4). Hi contrast for microfilm and recording enlargements.
100's 1.19
3 Boxes 3.19

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Qt. Size: 3 for 3.25
(1.29 ea., 6 for 6.00)
3½-Gal. (wgt. 22 lbs.) exp. coll. only—6.95
(Shpg. wgts: 1 qt.—3 lbs., 6 qts.—6 lbs.)

4 x 5 ANSCO COLOR
Daylite or Tungsten
Pkge. of 10 ... 1.75
3 for 4.95

35mm x 12-EXP. EASTMAN COLOR
(Tropicolor)
Color negs. give large 2¾x3½ color prints. Price includes Processing. PLUS FREE 2¾x3½ color print made from one of your negatives when film is processed.
Complete only 1.75
3 for 4.95
12 color prints (2¾x3½) 2.95

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8x10 SW, SM, #2, 3, 4, 100's	1.50	3.98
8x10 DW, SM, #2, 3, 100's	3.50	10.00
10x10 SW, SM #2, 125's	2.75	7.75
10x10 VARIGAM, 250's	7.00	20.00
11x14 DW, SM, #2, 3, 50's	3.50	10.00

35mm x 100' SAFETY FILM*
Guaranteed. Plus-X, Super-XX, Background-X, Microfile, Ansco Supreme, in metal day. loading cans. Specify film wanted. 1.75 ea.
Any 3—4.98

New E.K. TRI-X
ASA200 Day. ASA160 Tung.
6 for 1.49

35mm x 100' SAFETY FILM*†
PLUS-X, SUPER-XX. Reloaded but guaranteed. Specify film. Any 5 for 5.50
Any 10 for 10.00
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4 x 5 CUT FILM*†
Isopan, Proc., Ortho, Infra-Red, Triple-S Ortho, Super Pan Press, Arrow Pan. 25 sheets to Pkge. 1.29
Any 3 for 3.75

Write for Bargain Listing. * Surplus but guaranteed. † Reloaded from bulk.

DELPRO SALES CO. (Dept. P-1) Smithtown, N. Y.

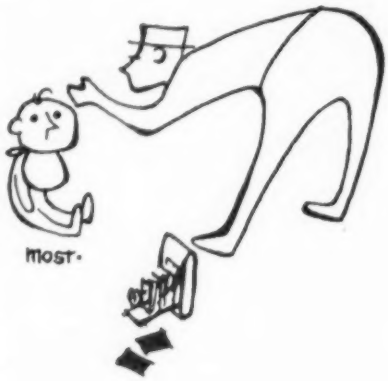
CONTESTS AND MARKETS

TWA has opened its 19th Annual Aviation Writing and Picture Competition with a category devoted to photographic stories on commercial aviation published in the year between September 15, 1955, and the deadline, September 15, 1956. The prize of $100 and a plaque will go to the winner in each of the following categories: Newspapers with circulation of over 75,000; Newspapers with circulation of 75,000 or under; black-and-white photos in general-interest magazines or Sunday supplements; Color. An additional $100 will go to the best of the photographic entries, along with an annually rotating trophy. Send entries and requests for further information to TWA Aviation Writing & Picture Competition, 19th Floor, 380 Madison Ave., New York 17, N. Y.

GAINES DOG RESEARCH CENTER is again conducting its dog photography contest awarding to three top winners prizes of $500, $250, and $100. Pictures should feature a human-interest element and although people may appear in the photographs, the dog should be dominant. Contestants may submit an unlimited number of black-and-white unmounted, unretouched prints of any size; only prints covered by sufficient postage will be returned. Mail requests for further information and entries to the Gaines Dog Research Center, 250 Park Avenue, New York 17, N. Y.

THE SOUTHERN CALIFORNIA ASSOCIATION OF AMATEUR MOVIE CLUBS has opened its first annual contest for amateur film makers in the eleven western states and Hawaii. It is to be called **The Ten Best of the West.** Winners will be awarded trophies as well as trailers indicating their movies' selection for the year. Films on any subject matter made by amateurs in color, black-and-white, silent or sound, in 8-mm or 16-mm size, are eligible for entry before the deadline date of October 1. Further information and entry blanks are available from Mr. Edward Garwood, 11133 Valley Spring Place, North Hollywood, California.

THE TENTH INTERNATIONAL ZOO PHOTOGRAPHY CONTEST, featuring photographs of animals taken in any recognized zoo in the world, has been announced by the Nature Camera Club of Chicago and the Chicago Zoo. Black-and-white prints must be 8x10 or larger and mounted on 16x20 mounts; however, foreign entries may be submitted unmounted. In the color division, 2x2 to 3¼x4½ slides are requested. Prizes, duplicated in both classes, are as follows: 1st—$50, 2nd—$25, 3rd—$10, and 20 honorable mentions of $5 each. In cases where winning photographs were taken at the Brookfield Zoo, prizes will be doubled. The necessary entry blanks are available from the Chicago Zoological Park at Brookfield, Illinois, and must be postmarked no later than the contest deadline, September 15.—▶



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CAMERAS, STILL

6. (f) Argus Photo Tip Portfolio: 5 Booklets on Flash, Filter Magic, Curtain Time, TV Pictures, Copying and Close-up. 25c. ARGUS CAMERAS, INC.

8. (a) Book: Complete reference book for amateur and beginner, "The Bolsey Guide," 128 pp., 70 illus., charts, tables, $1.95. (b) Circular: Bolsey Precision Cameras, features new Jubilee Threesome, prices. BOLSEY CORPORATION OF AMERICA.

11. (a) Brochure: "Bino-Fotography." (b) Booklet: "How to Select Binoculars." D.P. BUSHNELL COMPANY.

18. (a) Brochure: List and prices of 400 items for Exakta cameras. (e) Brochure: Automatic Exakta VX; New booklet. EXAKTA CAMERA COMPANY.

23. (a) Booklet: For Prize Winning Pictures—GRAFLEX, Specifications, etc.

26. (a) Booklet: The Royal Robot, (b) Booklet: Robot Underwater Camera; (c) Booklet: Robot Accessories. (f) Brochure: Gives full details on new full-frame 1" x 1½" Robot Royal 36-power-drive camera as well as accessories. INTERCONTINENTAL MARKETING.

31. (c) Booklet: Hints on camera care and picture taking; also describes complete line of Konica cameras; accessories. 16 pp., illus. KONICA CAMERA CO.

34. (a) Booklet: Minolta "A"; Minolta 35, Model II and Rokkor lenses. (b) Booklet: Minolta Autocord and Minoltacord. FR CORPORATION.

38. (a) Catalog: Discusses each Polaroid Land Camera, accessories, gives hints and ideas for using 60-second pictures, illus. POLAROID CORPORATION.

39. (a) Brochure: Information on book titled "35mm Photography With A Praktiflex." (b) Brochure: New booklet on the Prakticon-Praktiflex FX. PRAKTICON COMPANY.

41. (a) Brochure: "Realist 35"; detailed facts on Model A & B, accessories. (c) Brochure: Realist 45, description, illus. REALIST, INC.

45. (a) Booklet: Omega 120; data, description. SIMMON BROTHERS.

52. (a) Booklet: "The Voigtlander Line"; complete details, description, illus. (b) Booklet: Complete detailed information of Hasselblad Camera, accessories, 26 pp., illus. (c) Hasselblad Super Wide Camera, details, description of camera, accessories; 32 pp., illus. (d) Folder: "Hasselblad 1000F", illus., descriptive pamphlet of Hasselblad and accessories. (e) Folder: Illustrated and descriptive folder on Hasselblad Super Wide. WILLOUGHBY'S WHOLESALE.

53. (a) Brochure: "Edixa"; describes 35mm Edixa cameras, accessories, lists prices. WIRGIN BROS.

CAMERAS, MOTION PICTURE

7. (a) Brochure: The Auricon Cine-Voice; 16mm camera for professionals. (b) Brochure: Same as above, except for home movie makers. (c) Booklet: How to use your Cine-Voice, 16mm sound-on-film Recording Camera. (d) Catalog: 40 pp., illus., Auricon Cameras. BERNDT-BACH, INC.

12. (a) Brochure: "The Eumig 88"; description, details, lists accessories for this 8mm movie camera. CAMERA SPECIALTY.

26. (d) Brochure: Bauer 88 motion Picture Cameras; Descriptions and accessories; also details on Bauer 88B camera with built-in exposure meter. (e) Booklet: Bauer 8mm Cameras. Complete descriptive literature on the Bauer cameras as well as the story of Bauer plant in Germany. Material includes cameras, accessories and suggestions as to use of equipment. Illus. INTERCONTINENTAL MARKETING CORP.

30. (a) Booklet: 8mm full line covering all 8mm movie cameras and projectors. (b) Circular: 16mm full line covering all 16mm movie cameras and projectors. (d) **Book: Keystone Movie Scene Record Book; 15c.** KEYSTONE CAMERA COMPANY.

43. (a) Booklet: Cameras by Revere. REVERE CAMERA COMPANY.

63. (a) Catalog: Lists Wollensak Motion Picture Cameras, Projectors, Stereo Cameras and accessories, prices, descriptions. 12 pp., illus. WOLLENSAK OPTICAL.

MOTION PICTURE ACCESSORIES

29. (d) Booklet: "Editing for Better Movies" by Leo Heffernan, Reg. 50c, Special 10c. KALART COMPANY, INC.

37. (b) Magazine: "The Bolex Reporter," quarterly, available thru franchised Bolex dealers. PAILLARD PRODUCTS, INC.

42. (a) Brochure: RCA 400 Junior and Senior 16mm Sound Projectors; nontechnical description of operating features. Illustrates sound equipment which may be combined with projectors in semi-permanent or permanent installations, 12 pp., illus. RADIO CORPORATION OF AMERICA.

43. (b) Booklet: Features and operation Curvamatic Splicer. (c) Booklet: Curvamatic Splicer, details, data. (g) Booklet: Motion Picture Equipment. REVERE CAMERA COMPANY.

LENSES

11. (c) Pamphlet: "Those Startling Fujinons"; discusses the new 50mm F1.2 and 35mm F2 lenses. D.P. BUSHNELL COMPANY.

15. (a) Chart: How to use Two Ednalite Portrait Lenses. (b) Brochure: Portrait Lens Instructions; tables, charts on +1, +2, +3 portrait lenses. (c) Reprints Ed N. Lite Column: informal, simple information on use of EdnaLite Filters. (d) Charts: EdnaLite Color Filter Selector—the correct EdnaLite to use under approximate lighting conditions of all kinds. (e) Filter Guides: Listing and describing all available EdnaLite Filters, filter factors. (f) Booklet: The EdnaLite Story—Complete story with photographs, telling and showing how EdnaLite Solid Optical Glass Filters are made, from raw glass to finished product. (g) Memo from Ed N. Lite—Complete with description of EdnaLite Filter Kits and Filter Factor Chart. (h) Leaflet: Facts and information on the Reversible Wide Angle/Telephoto EdnaLite Dual-Lens. EDNALITE OPTICAL COMPANY.

16. (a) Leaflet: "How To Use Enteco Polarizing Screens and Enteco Polarizing Filters with Still and Movie Cameras." (b) Leaflet: New Enteco data and information charts on close-up photography with supplementary lenses. (c) Leaflet: Revised edition of Enteco "Filter Information," handy filter factor and film speed chart, filter types. ENTECO INDUSTRIES.

17. (a) Booklet: "Take A Tip From Hollywood," describes Elgeet lenses, instructions on home movies, etc., 36 pp., illus.; 10c. ELGEET OPTICAL COMPANY.

18. (b) Brochure: Steinheil lenses, wide angle, telephoto and movie lenses. (c) Brochure: Angenieux Lenses, complete information on construction, angles of view, relative magnification, range, focal length. **(d) Catalog: "Equipment Information from Exakta," lists latest lenses recommended for the Exakta Camera, 28 pp., illus. 10c.** EXAKTA CAMERA COMPANY.

28. (b) Folder: How to Use Your Elitar Soligor Lens, descriptive information on Telephoto, Wide Angle, prices. INTERSTATE PHOTO SUPPLY.

31. (b) Chart: Shows test of Hexanon 50mm F/2.8 lens as used in the Konica II. KONICA CAMERA COMPANY.

52. (f) Booklet: "Zeiss Lenses For The Hasselblad Camera," detailed information and discussion of Zeiss lenses for the Hasselblad; 16pp. illus. WILLOUGHBY'S WHOLESALE.

54. (a) Booklet: Raptar 8mm cine lenses. (b) Booklet: Raptar 16mm cine; depth of field projection charts. (c) Booklet: "How to Have More Fun With Your Camera." WOLLENSAK.

61. (a) Circular: Slip-On Filters. (b) Circular: Hi-Trans Filters. (c) Circular: Auxiliary Close-up Lenses for all movie and still cameras. (d) Circular: Photar Filters. (e) Circular: Tiffen-Polaroid Light-Polarizing Filter. (f) Folder: Neutral Density Filters, explanation of neutral density filters—what they are and how they work, illus. (g) Folder: Wallet size, Handy Filter Selector. Lists filters for color films, black and white films, also gives exposure guide for Kodachrome and Ektachrome films. (h) Brochure: Tiffen Filter Adapter Ring Selector lists Tiffen special adapter rings for specific still cameras, movie cameras; also lists Tiffen Screw-in Lens Caps and standard adapter rings, prices, etc. TIFFEN MARKETING CO.

PROJECTORS, SLIDE

5. (a) Booklet: How To Select A Slide Projector. AMERICAN OPTICAL.

21. (c) Folder: Describes Skan automatic "slide-cooling" projector, illus. G-M LABORATORIES, INC.

44. (a) Brochure: A complete listing of all regular View-Master Reels and Packets, including product prices. (b) Brochure: Stereo Today, a complete coverage of the View-Master Stereo System, information on products in this system. SAWYER'S, INC.

48. (a) Leaflet: Engineered projection equipment; data, details. VIEWLEX.

65. (a) Booklet: "How to Show Your Slides Without Losing Your Friends"; step by step procedure for building a slide program instead of a series of individual pictures. LA BELLE INDUSTRIES.

FLASH EQUIPMENT

1. (a) Booklet: Various styles of lighting equipment for still pictures, indoor movies and 3-D shots. (b) Folder: Describes use of multiple floodlamp control box, gives electrical facts affecting use of flood and flash lamps; 6pp. (c) Catalog: Photoflood Lighting, highly descriptive and illustrated 16-page booklet of lighting equipment for amateur and professional photographer. Includes lighting tips on indoor still and movie pictures with diagrams, charts, etc. ACME-LITE MFG. CO.

4. (a) Booklet: "How To Take Professional Flash Pictures With Your My-T-Myte Flashbulbs," 8pp., illus. AMPLEX.

13. (a) Booklet: "Light Makes the Picture, Synctron Takes It Better." (b) Booklet: Current technical data on Synctron models. (c) Catalog: Includes accessories, technical information, prices, individual specification sheet for each model. (d) Folder: "55 Quick Facts on Dry Battery and Dynaseal Power." DORMITZER ELECTRIC COMPANY.

22. (a) Folder: "Triangle Lighting" formula for taking indoor pix with light. (b) Booklet: Photoflash Tips. (c) Bright Ideas-flash pix of parties, kids, adults. (d) Photolamp Data—lighting, exposure, film speed for flash, flood, other lamps. (g) Booklet: The M-2 Bulbs; data information on the "tiny" bulbs. GENERAL ELECTRIC.

23. (b) Folder: Graflite. (c) Folder: Stroboflash. GRAFLEX.

24. (f) Folder: "Why You Will Get Better Flash Pictures with the Heiland Foto-Mite," 14 pp., illus., how to use the flash unit, with picture-taking hints. (g) "Take Your Pick" folder, illus., describing new Strobonars 61A, 62A, Seven and 71A, with light distribution comparison photos and accessories. (h) Folder: "The Heiland Professional Line"—Flash Units, Synchronizers and Standard Strobonars," describes Strobonars I, III, IV, Six, famous Press Model Synchronizers, Synchro-Customs, and complete accessories including cords, reflectors and battery cases; illus. HEILAND.

34. (c) Booklet: Minolta Jr. B-C Flash Gun. FR CORPORATION.

25. (a) Folder: Sun-Lite II; description and illus. on speedflash. (b) Folder: Sun-Lite 500, description and information, 6pp. illus. (c) Folder: Flash Saver, description. 4 pp. (d) **Manual: Sun-Lite II instruction booklet, detailed information on Sun-Lite II Portable Speed Flash, all 3 models; 20 pp., illus.; 25c.** HERSHEY MFG. COMPANY.

28. (a) Folder: Describes 3 models of electronic flash, Expert IV, Matador, Reporter I, prices. INTERSTATE PHOTO SUPPLY.

29. (c) Folders: Kalart Flash Equipment, BC-400 and Kalart Super Speed Flash. (e) How B. C. by Hy Schwartz. KALART COMPANY, INC.

35. (a) Booklet: Eveready Battery Engineering Bulletin on flash photography, 12pp. illus.; issued periodically; (b) Eveready Batteries, data, helpful information "B," "B-C" batteries. NATIONAL CARBON COMPANY.

36. (a) Leaflets: Technical information and data on use of the Megalume electronic flash. (b) Pamphlet: "Reciprocity Failure and the Determination of Exposure With Some Electronic Flash Equipment." NEMS-CLARKE, INC.

46. (a) Brochure: Listing of lighting equipment for semi-professional or advanced amateur. (b) Brochure: Complete listing of lighting equipment for the amateur and movie maker. (c) Booklet: "Indoor Photos Made Easy," how to do indoor lighting, 10pp., illus. SMITH-VICTOR CORPORATION.

47. (a) Folder: "Flash is Easy—Flash is Fun"; complete flash instruction for advanced, amateur, beginner. (b) Booklet: How to Take Better Pictures and Have More Fun With Flash; 32pp. illus. (c) Booklet: Color Flash with Box Cameras. (d) Booklet: How to Throw a Snapshot Party; 24pp. illus. (e) Card: Wallet Size, gives correct F-stops. (f) Brochure: Basic Lighting Placement, illus. (g) Specification Sheets: 1. Blue Dot Line; 2. Projection Lamps; 3. Darkroom and Enlarger Lamps; 4. Super-floods. SYLVANIA ELECTRIC.

8. (c) Exposure Guide: Pocket size, gives correct F-stops. BOLSEY CORPORATION OF AMERICA.

50. (b) Brochure: The ABC of Flash Photography; guide to how, when, why to use flash bulbs. (c) Brochure: Your guide to better pictures thru better lighting; comprehensive discussion of Westinghouse bulbs.

55. (a) Booklet: Descriptive data and information on Limelite "60"; 14pp., illus. (b) Folder: Describes Limelite Electronic Flash: 4pp. illus. (c) Folder: Yankee Complete Home Developing and Printing Kit, 6pp. illus., instructions for use of Yankee Photo Developing and Printing Kit; making your own negatives; making a picture from your negatives; loading the printing frame, etc. (d) Catalogue: Yankee photo products; 35mm slide trays and accessories, electronic flash, developing and printing accessories, illus., prices and description. YANKEE PHOTO PRODUCTS.

57. (a) Brochure: 6pp., Mallory B-C Cartridges photo flash item; complete cross-reference unit to flash attachment; 50 units; Mallory B-C Mercury Cartridges. (b) Leaflet: Complete explanation of application of Mercury for foto-flash. P.R. MALLORY & CO.

62. (a) Booklet: Electronic Flash. (b) Booklet: Brighter Way to Better Pictures, 16pp. FR CORPORATION.

PROCESSING EQUIPMENT AND MATERIALS

10. (a) Brochure: Illustrating design and function of Model 45M Enlarger, 24pp. (b) Leaflet: Additional uses of Model 45M Enlarger. (c) Pamphlet: Discusses characteristics and operation of Model 57MB. (d) Book: A Brief 73 Year History of Enlarger Design, 32pp. CHARLES BESELER COMPANY.

19. (a) Booklet: "How to Buy an Enlarger." FEDERAL MANUFACTURING AND ENGINEERING CORP.

27. (a) Leaflet: Time-O-Lite Printer. (b) Leaflet: Time-O-Lite Meters and Switches. INDUSTRIAL TIMER.

33. (a) **Booklet: "Marshall's Guide for Hand-Coloring Photographs," special section on heavy oils, 36 pp., illus. 25c.** (b) **Pamphlet: Color Chart: Marshall's photo-oil colors, price list of sets, accessories, 10c.** (c) Pamphlet: Make Life More Colorful, discusses photo-coloring; (d) Pamphlet: Information on the photo-oil pencil. (e) **Book: "Photo-Oil Coloring for Fun or Profit," 17 chapters, 148 pp, 22 illus., color charts, 9 color plates; explains detailed portrait work, right papers for coloring, how to mix paints, color harmony, landscapes, etc. $3.50.** JOHN G. MARSHALL MANUFACTURING CO.

45. (b) Catalogs: Omega A-2, B-7, B-8, D-2, D-3, E-5; (One on each model, specify which you want.) (c) Booklet: How To Buy The Right Enlarger. (d) Booklet: Omega Distortion Correction Attachment. SIMMON BROTHERS.

56. (a) Folder: Describes "Static Master," gives uses and prices, 3pp. illus. NUCLEAR PRODUCTS.

58. (a) Brochure: Discusses Lisco Cut Film Holder; gives data and information on exclusive features. LISCO PRODUCTS.

60. (a) Booklet: Clayton P-60 Fine Grain Developer; detailed instruction on use; 16pp. illus. CLAYTON CHEMICAL CORP.

64. (a) Booklet: Describes methods and materials for mounting transparencies for viewing and projecting. ERIE SCIENTIFIC CORP.

62. (c) Booklet: Cut Film Pack Developing Tank. (d) Booklet: Developing Tank. (e) Booklet: Proven Liquid Chemicals. (f) Booklet: You'll Enjoy Developing & Printing. (g) Booklet: Big Picture Fun for Everyone (Enlarger). (h) Booklet: Home Developing & Printing Kit. (i) Booklet: Developing & Enlarging. FR CORPORATION.

68. (a) Catalog and Handbook: 18 pages, illustrated, Nega-File slide cabinets, accessories. NEGA-FILE COMPANY.

EXPOSURE METERS

20. (a) Booklet: Catalog sheet and booklet describes original direct-reading, photo-electric exposure meter, reading directly in f: stops, with film speed charts. (b) Brochure: "Ideal Rangefinder," instructions for calibrating rangefinders. (c) Brochure: Catalog sheets, golf club selector guide, information on Long-Range Rangefinder and its uses. FEDERAL INSTRUMENT CORP.

21. (a) Circular: Describes the Skan Quick Meter, price, information. (b) Booklet: Technical data, information on use and care of Skan Meters, helpful hints, 24pp. illus. G-M LABORATORIES, INC.

22. (e) Leaflet: GE Exposure Meters, significant features which adopt one of three GE meters to specific requirements. (f) Booklet: Color Control Meter and Variable Color Filter; how to achieve full control of color. GENERAL ELECTRIC.

51. (c) Booklet: Help in Selecting the Right Exposure Meter. 15pp., illus. Describes and discusses the workings of a meter. WESTON ELECTRICAL INSTRUMENT CORP.

PICTURE TAKING ACCESSORIES

40. (a) Booklet: "New Super Quick Set Universal Photographic Support," illustrates and describes new system for handling cameras and related accessories, 12pp. (b) Folder: "Whitehall Tripods."6pp. illus. QUICK-SET, INC.

59. (a) Catalog: 12pp., illus.—describes all types of camera bags and leather goods of use to the photographer, lists prices. J. B. PERRIN CO.

67. (a) Catalogue: 10 pages describing the complete list of products. TEST-RITE INSTRUMENT CO.

FILM, PAPER

3. (a) Booklet: Ilford Flat Films, 12pp. illus.; information and technical data. (b) Brochure: Ilford Roll Films, data and description; 6pp. (c) Circular: Ilford Microphen Developer, how to use it, and what it does. ALCO PHOTO SUPPLY.

43. (d) Booklet: Features and instructions on uses of Diaversal Enlarging Paper. REVERE CAMERA CO.

62. (j) Booklet: Special Adjustable Roll Film; FR CORPORATION.

VIEWERS

2. (a) Booklet: Describes in detail features of Admiral Slide-Light Viewer; 8pp ADMIRAL PHOTO PRODUCTS.

66. (a) Brochure: 4pp. illus., data, details, 35mm Opta-Vue hand viewer. OPTICS MANUFACTURING COMPANY.

62. (k) Booklet: Your Port-A-View; FR CORPORATION.

SLIDES, STEREO

43. (e) Booklet: Features of Shield 'N Vue Slide Projectors. REVERE CAMERA CO.

TAPE RECORDERS

43. (f) Booklet: Features of hi-fi "Balanced Tone" Tape Recorders. REVERE CAMERA COMPANY.

19. (b) Circular: Model 37C; Model 47A; description, data. FEDERAL MANUFACTURING & ENGINEERING CORP.

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52c	52d	52e	52f	53a	54a	54b	54c	55a	55b	55c	55d	56a
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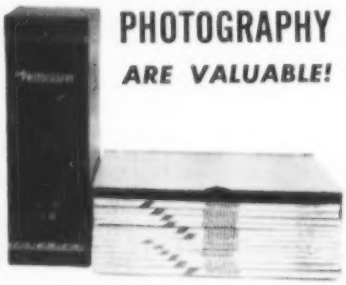

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PHOTO TIPS – SHORT CUTS TO BETTER PICTURES

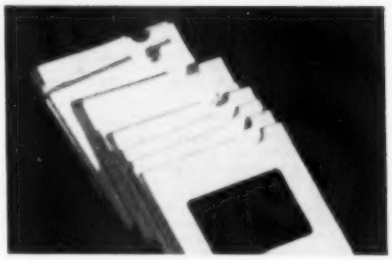
Storing Replenisher

With an ounce of replenisher as the average amount per roll of film (or its equivalent) having the liquid on hand in 1-oz bottles assures availability of correct quantity without measuring for each use, and keeping bottles full discourages oxidation. If a quart of replenisher is mixed, eight 1-oz bottles can be filled, and remainder can be stored in a 1-pt bottle and a ½-pt bottle until contents of the 1-oz bottles are used.—*F. H. Ochee, Haverhill, Mass.*

Key Ring for Gadget Bag Closure

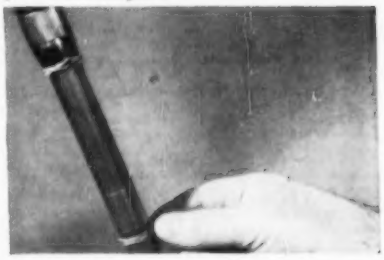
For camera gadget bags that are equipped with zipper closures, a small or medium-size key ring attached to the tab of the fastener will prove to be convenient, and provides a firm hold for quick opening and closing of the zipper. It's especially convenient when, in a rush, you're trying to locate and extract flashbulbs, film holders or other necessary items from the gadget bag without looking, and in cold weather when you're wearing gloves. —*A. M. Wettach, Mt. Pleasant, Iowa.*

Notched Mounts on Film Slides



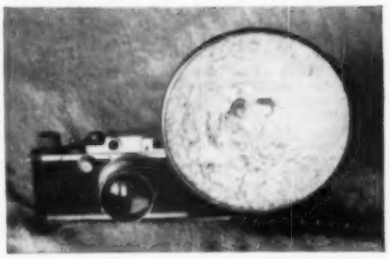
Notching the cardboard mounts of film slides will save time and facilitate smooth operation when projecting the slides. A paper punch will do the job quickly and easily. Hold each slide in correct position for projecting (upside down, with emulsion side away from you) and use the punch to cut a small, semi-circular notch in upper edge, about ⅜ inch from right. Easily located in dark, notches assure accurate positioning of slides in projector. —*H. E. Parry, New York, N. Y.*

Intermediate Height for Tripod



Strong, heavy rubber bands, used as shown in the accompanying illustration, provide a method of setting a camera tripod at intermediate height as required. If several bands are twisted around each tripod leg, they will keep the legs from telescoping between sections, thus holding the tripod at the desired height. The rubber bands should be strong and in good condition, and each of them rolled securely into the position required to hold firmly.—*G. C. Greene, Detroit, Mich.*

Line Flash Reflector



If a flash or speedlight reflector seems responsible for "hot spots" or uneven lighting, try lining reflector with a sheet of aluminum foil. The foil should be crumpled lightly, then fitted carefully into the reflector (keeping shinier side of the foil outward, dull-finished side toward the reflector). It is held in place by crimping the foil edges over the reflector rim. Light output usually will be affected very little by use of this method. —*T. Henke, Chowchilla, Calif.*

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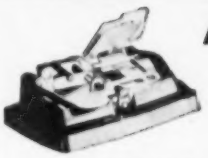

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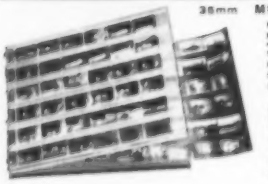

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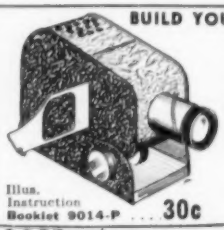

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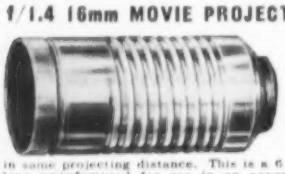

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